

Manufacturers Record

Southern Industry and Defense

In putting industrial America to work on a defense program, it is inevitable that the vast natural resources of the Southern states and their availability for War Department needs will have an essential place.

Long regarded as an agricultural region, manufacturing in the South now exceeds the value of all agriculture by more than two and one-half times. Capital invested in Southern manufacturing since 1920 has increased by \$3,136,000,000, or 31 per cent, while the capital invested for all the rest of the country in the same period increased \$5,719,000,000. The South now has 21 per cent of the country's plants, with the value of its manufactured products almost 20 percent of the total value of products made by the entire United States.

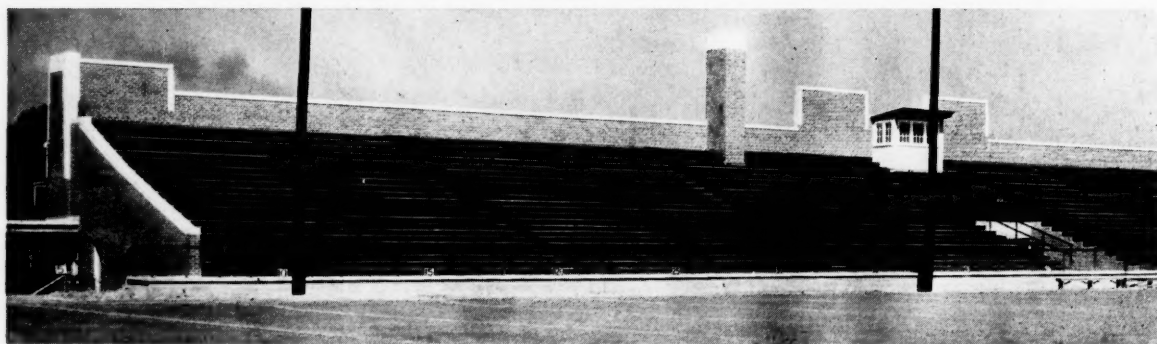
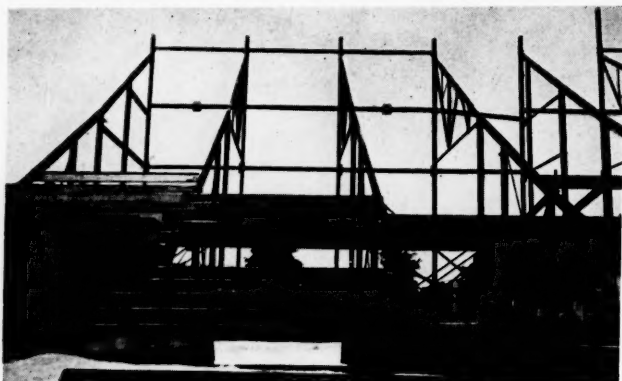
A meeting called by Governor Rivers of Georgia, to be held June 10 in Atlanta, will endeavor to coordinate the efforts of independent agencies now working for the South's industrial development. There will be present representatives of transportation and power interests, as well as financiers and heads of industrial enterprise. It will be determined how best not only to assist the government in its defense plans, but to effectively promote through a central operating agency the industrial development of the South. The timeliness of a move of this kind is emphasized by increasing interest now being shown by industrialists in all parts of the country in Southern plant locations.

The major subject to be discussed assumes added importance in view of the President's call for a large increase in the country's defenses. Expansion of existing plant facilities will be necessary, and it is known that the War Department favors the location of branch or main plants at interior points away from exposed locations.

Chemical, metal working and industrial establishments of wide variety find in the South a freedom from labor troubles that is in strong contrast to many of the industrial centers of the North and East. Adequate transportation and power facilities, climate, abundant raw materials and labor make for ideal manufacturing conditions, and this is what has attracted and proven successful in so many lines of production in which the Southern states now lead the country. Coal, oil, minerals, timber, are all in abundance at interior points, and at the same time plants located away from the coast have ready access to the Atlantic and Gulf, as well as to Northern points.

The South with its population embracing 97 per cent American born, has been described as the outstanding bulwark of Americanism. At this juncture when a unified America intends to make our defenses impregnable physically and from fifth column movements, the Southern states well may take a leading part in providing necessary materials and men and strategic locations for plants.

JUNE 1940



THE HOW ^{AND} WHY OF STEEL-DECK CONSTRUCTION for STADIUM and GRANDSTAND

The accompanying pictures show a few essential features of HOW a Virginia Bridge steel-deck stadium is constructed.

The WHYS for steel-deck construction are many—a few of them are:

1. More economical to build than any other permanent type of construction.
2. Low Upkeep—No maintenance required except an occasional coat of paint, which preserves the structure indefinitely.
3. Thoroughly adaptable to any local requirement as to size and design—also to any ground contour without grading.
4. Easy to extend by adding standard sections at ends, or by double-decking with welded watertight steel plates.
5. Steel-deck plates welded watertight form a perfect roof for room facilities beneath the stadium when desirable to utilize this space for lockers, showers, class rooms, etc.
6. Scientifically plotted and designed by experienced stadium engineers for maximum comfort, convenience and economy.
7. Combines all the inherent qualities of steel that makes it the most dependable and useful building material known to man.
8. Simplicity of fabrication, ease and speed of erection assures quick delivery and completion.

Our engineers are at your service for free consultation of your stadium problem. Designs and estimates furnished without obligation for definite projects.

PICTURES

1. Steel supporting frame and steel-deck plates during erection.
2. Steel seat brackets, with holes provided to attach wood seat boards, welded to finished steel deck.
3. Wood seat boards are bolted to the steel brackets.
4. Bessemer, Ala. High School Stadium complete with brick walls enclosing offices, concession booth, etc. under the steel deck.

Virginia Bridge

VIRGINIA BRIDGE COMPANY

Roanoke

Birmingham

Memphis

Atlanta

New York

Dallas

FACTORIES

to locate where?

What are the trends?

There are many good reasons why the South is advancing at a greater pace than the rest of the nation.

Consider the following:

Between 1935 and 1937 the number of establishments with an annual output in excess of \$5,000 increased 803 in the South, a sharp contrast to a decline of 3,120 for the rest of the country.

Between 1880 and 1930 the South made average gains in each decade of 92% in the value of manufactured products. This compares with 76% for the rest of the country.

A careful estimate of the gains in invested capital in Southern manufacturing from 1920 to 1939 approximates 31% as compared with an increase for the entire country of only 19.5%.

Between 1890 and 1930 the South made average gains in each decade of 90% in the amount spent for wages in manufacturing. This compares with 79% for the rest of the country.

In 1937 the South had 202,000 more wage earners than in 1930. The rest of the country employed 730,000 less; the South increased by 12.5% while the rest of the country declined 9.5%.

"The SOUTH'S RESOURCES"

to be published soon

Splendid advertising copy for this issue is coming in and will guide inquirers to private sources of information in addition to reading pages.

The fullest cooperation may be expected from the MANUFACTURERS RECORD and these outstanding representative firms.

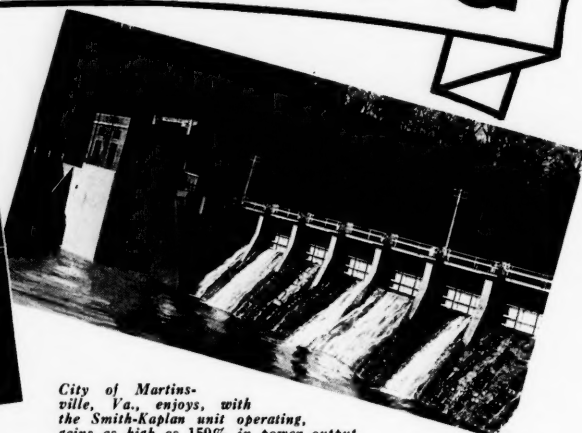
"The SOUTH'S RESOURCES" will show its readers specifically the many opportunities the South offers new industries, and the Southern states resource maps and articles already published and factual information in our files will aid in studies of locations for plants in the nation's plans for speeding up production for national defense.

MANUFACTURERS RECORD

BALTIMORE, MARYLAND

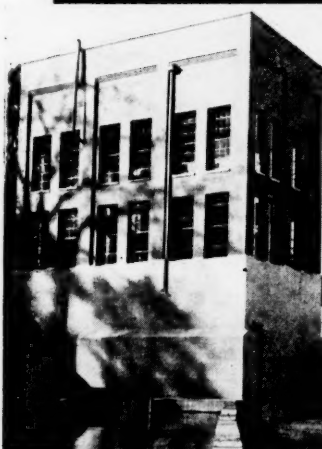
modernized

Radford, Va., reports savings in fuel costs because of less use of Diesel standby equipment.



City of Martinsville, Va., enjoys, with the Smith-Kaplan unit operating, gains as high as 150% in power output.

Jackson Mills' North Carolina plant states generated power valued at thousands of dollars more than that obtainable with any other type of hydraulic turbine.



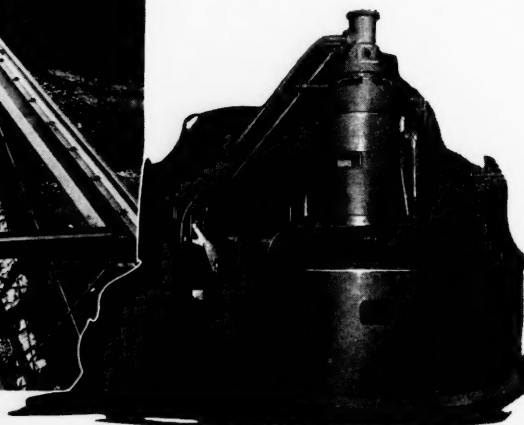
with SMITH - KAPLAN TURBINES

THESE modernized plants are striking examples of what is available, in the way of improved operating efficiency and lower power costs to water power users.

If you haven't considered the many advantages offered by, or are not familiar with the SMITH-KAPLAN Automatically Adjustable Blade Turbine, write to us. One of our engineers will be glad to assist you in reducing power costs and improving your service to customers, through adopting modern hydraulic turbine equipment. Write us for data!



Smith-Kaplan 1000 KW Turbine produces maximum power per cu. ft. of water used at Millville, W. Va., plant of N. Va. Power Co.



4000 Hp. Smith-Kaplan turbine, controlled from main station two miles away, assures maximum annual KW output, by maintaining high efficiency over wide range of load.

S.
MORGAN

SMITH

COMPANY
YORK, PA.

TABLE OF CONTENTS

JUNE, 1940

Volume 109, Number 6

EDITORIALS

Southern Industry and Defense	Cover
Men of Proven Ability Needed	21
The Importance of Small Industries	22
The South in Summer	22
Agricultural Exports	22
Ford Motor Company a Buyer of Southern Products	23
Defense Without Politics	23
The Allies' Vital Need	23

FEATURE ARTICLES

South Bids to Share in Defense Effort by T. N. Sandifer	24
"Face-Lifting" With Structural Glass by Earl Aiken	26
The South's Materials for the Country's Defense	28
Alabama and Arkansas	28
Florida and Georgia	29
Kentucky, Louisiana and Maryland	30
Mississippi, Missouri and North Carolina	31
Oklahoma and South Carolina	32
Tennessee and Texas	33
Virginia	52
West Virginia	54
The Industrial Outlook for Soybeans by A. A. Horvath	36
Larger Prospects Seen for Industrial South	38
New Industrial Plants and Expansions in the South During May, 1940	40

DEPARTMENTS

Letters and Comments	7
New Ways of Doing Things	42
Finance and Industry	44
Industrial News	48
Trade Literature	50
Index for Buyers	64
Index of Advertisers	66

MANUFACTURERS RECORD

Devoted to the Upbuilding of the Nation Through the Development of the South and Southwest as the Nation's Greatest Material Asset

Published Monthly by the
MANUFACTURERS RECORD PUBLISHING CO.
FRANK GOULD, President

Main Office: Manufacturers Record Building, Commerce and Water Streets,
Baltimore, Md. Phone: Plaza 7080-1.
Branch Offices: New York—11 W. 42nd St. Phone: Longacre 5-7180.
Chicago—28 East Jackson Blvd., Room 1510. Phone: Harrison 5867.
Cleveland, O.—850 Euclid Ave., Room 310. Phone: Cherry 4050.

Subscription Rates: One Year \$2.00, Two Years \$3.00. Single Copies 25c, back numbers over 3 months old 50c. Other Publications of the Manufacturers Record Publishing Co. Construction (daily and monthly issues) \$10.00 a year. Construction (monthly issues only) \$2.00 a year. Blue Book of Southern Progress (annual) \$1.00 per copy.

Member A.B.C.

Entered as second class matter at the postoffice, Baltimore, Md., U.S.A., under act of March 3, 1879. Volume 109, Number 5 Monthly

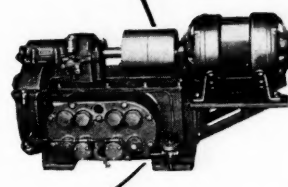
JUNE NINETEEN FORTY

..... Outstanding
PERFORMANCE

"All-Purpose"

AIR . . .
COMPRESSORS

- ★ Efficient
- ★ Reliable
- ★ Durable



Type "N" Compressor

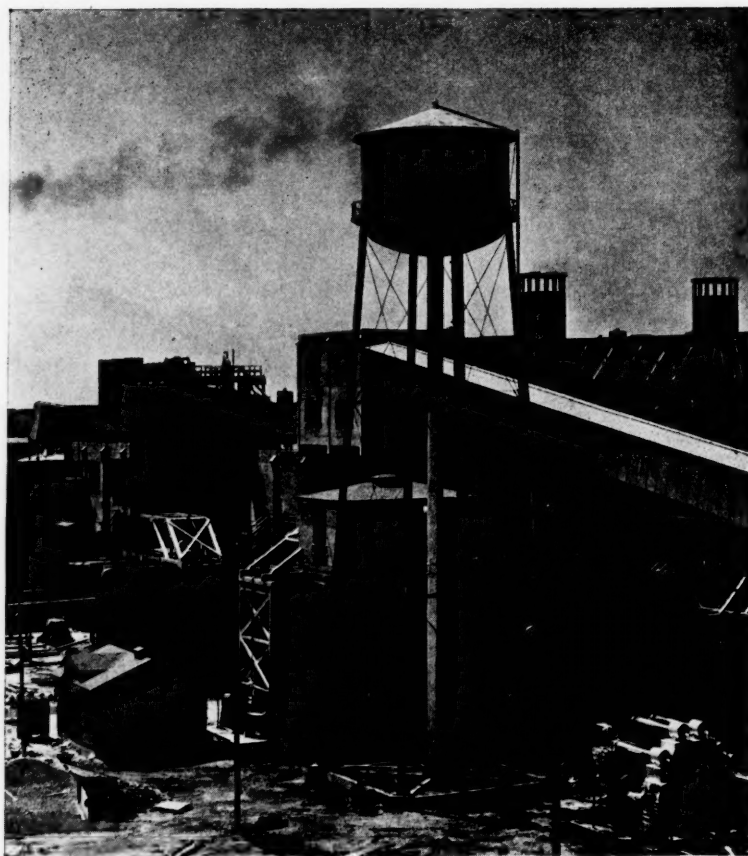
Two cylinder, single-stage, single acting, gear driven. Air-cooled for intermittent operation, "NB"; water-cooled cylinder heads for continuous operation, "NWB". Has positive and reliable unloader for A.C. motor drive. Sizes 12½ to 100 cu. ft. Pressures from 30 to 150 lbs. Catalog T2048. Write for information and prices.



Many other types and sizes available, up to 200 cu. ft. . . . There is one in this extensive line to meet your specific needs.

70 Years Experience

Westinghouse . . .
AIR BRAKE CO.
Industrial Division
PITTSBURGH, PA.



TANKS...within the gates of American pulp mills

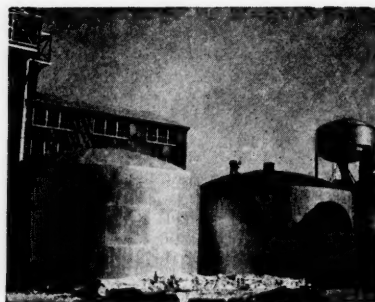
Tanks and other steel plate structures are playing a big part in keeping American pulp mills operating. However, they are the kind of tanks in which water or acid is stored, or in which pulp is digested. Their purpose is production, not destruction, and they are just as important to the pulp industry as any machinery used in the process.

Elevated steel water tanks, such as the one pictured above are used to provide constant water pressure for fire protection and for general mill use. Oftentimes several installations are used at the same mill. For instance, the plant pictured above has three separate elevated tanks.

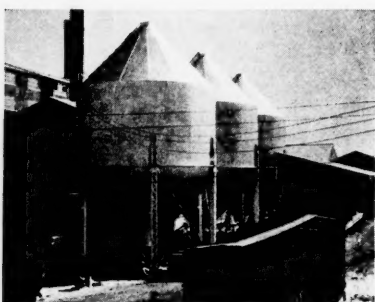
Flat bottom storage tanks are built in standard capacities for fuel oil, acid, or water storage. Special designs may be obtained to suit a special process or to fill a particular need.

We build welded digesters at our Birmingham plant where we have facilities for x-raying the joints and for stress relieving the completed structure as a unit. Other pulp mill equipment fabricated and erected by us includes welded diffusers, cyclones, salt bins and steel pipe.

If your plant has need of any type of steel plate work, our nearest office will be pleased to furnish designs and estimates.



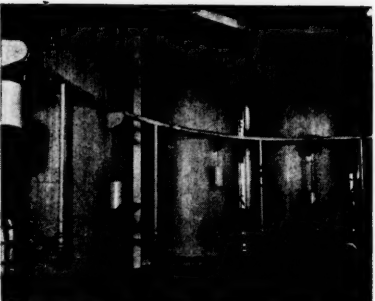
Two 40 foot diameter flat bottom liquor tanks and a 50,000-gal. wash-water tank (rear) recently erected in Georgia.



Three 30 foot diameter by 50 ft. 6 in. all-welded salt cake storage bins.



12 foot diameter by 45 foot welded digester being removed from our stress-relieving furnace after having been x-rayed.



Lower portion of the six 46,000 cu. ft. all-welded diffusers recently installed in a pulp mill in Florida.

CHICAGO BRIDGE & IRON COMPANY

Birmingham1530 North Fifth Street
Dallas1408 Praetorian Bldg.
Houston918 Richmond Ave.
Tulsa1611 Hunt Bldg.

New York3313-165 Broadway Bldg.
Cleveland2216 Rockefeller Bldg.
Chicago2106 McCormick Bldg.
San Francisco1040 Rialto Bldg.

Philadelphia1619-1700 Walnut Street Bldg.
Detroit1510 Lafayette Bldg.
Boston1510 Consolidated Gas Bldg.
HavanaEdificio Abreu 402

Plants in BIRMINGHAM, CHICAGO and GREENVILLE, PA.

B-730

AND COMMENTS

More About the Wicker Articles

Dr. John J. Wicker,
MANUFACTURERS RECORD:

I have read with much interest and approval your article in the May issue of MANUFACTURERS RECORD. You are preaching a sound doctrine and my only regret is that in one way or another your views are not available to a greater proportion of our population.

H. HITER HARRIS, *Pres.*,
First and Merchants National Bank of
Richmond,
Richmond, Va.

* * *

Editor, MANUFACTURERS RECORD:

I enclose \$1.00 for eight months' subscription to the MANUFACTURERS RECORD, and I will be very candid with you that the only reason I am subscribing for the MANUFACTURERS RECORD is to get a series of Dr. Wicker's articles.

I have just read his comment on "A Changing World" . . . it is the most graphic and concise description of that condition that I have yet read.

F. M. SCHEIBLEY,
Strath Haven Inn,
Swarthmore, Pa.

* * *

Editor, MANUFACTURERS RECORD:

Reference your May, 1940, issue, "What's the Cause of Anti-American Isms" by Dr. John J. Wicker, President, Fork Union Military Academy, Fork Union, Va., do you have reprints? If not, will you mind supplying us with a copy of that and permitting its reprint?

We plan its reproduction photographically, with credit line to MANUFACTURERS RECORD. If you have reprints, we'd as soon or rather pay for what we will need.

Incidentally, Dr. Wicker has written a splendid story. That's why we want to distribute it.

HARRIS MITCHELL, *Secretary,*
Virginia Building Material Assoc.,
Richmond, Va.

Reprints of all the Dr. Wicker articles are available upon application to this office and permission to reprint is granted upon application to those institutions and organizations that maintain their own publication.—Ed.

* * *

“The South’s Resources”

Editor, MANUFACTURERS RECORD :

I understand that within the next few months you are going to issue another booklet on the South, and would certainly appreciate your listing me as one of your first subscribers. I shall look forward to receiving this information.

I have enjoyed reading your magazine for a number of years and you are doing a great work for the South.

D. H. JOHNSON, *Vice Pres. & Cashier*,
The Citizens and Southern National Bank,
Augusta, Ga.

* * *

Editor, MANUFACTURERS RECORD:

Please send me a copy of your booklet "The South's Resources," announced in today's Wall Street Journal.

You speak in your notice of the newsprint plant at Lufkin, Texas. I am pleased to state that Charles Herty and I were classmates at Johns Hopkins University.

GEO. N. C. HENSCHEN,
Harrisburg, Pa.

"The South's Resources" is now in course of preparation and will be published in the near future. This volume will be the most exhaustive treatise yet published concerning factual data on the mineral, agricultural, and financial resources of the South, coupled with similar information regarding transportation, labor, taxation, and climate. In no other place will such complete details be found in one volume of the industrial opportunities awaiting development in the 16 Southern States.
—Ed.

(Continued on page 9)



The OIL BELT
The WHEAT BELT
The COTTON BELT
The CORN BELT

are all in the

FRISCO BELT

The
NATURAL
LOCATION for
INDUSTRY

In the vast, rich territory served by Frisco First, industrial opportunity is everywhere strikingly apparent. With a basis of low-cost hydroelectric power—abundance of oil, coal and gas—agreeable labor conditions, a large and fast-growing market for industrial equipment of all kinds, and a retail market of 13 1/2 million consumers . . . it is not surprising that nearly two thousand new and varied industries have established plants in the Friscobelt within the past five years.

Industries depending upon agriculture will find, in the Friscobelt, ideal soil and climatic conditions for the production of needful commodities. Facts that may seem stranger than fiction are yours for the asking.

Industrial Department, Frisco Lines
819 Frisco Bldg., St. Louis, Mo.

INDUSTRIES FLOURISH IN THE FRISCOBELT

Cities shown on the map include: ELLSWORTH, PITTSBURG-JOPLIN, KANSAS CITY, PORT SCOTT, ST. LOUIS, SPRINGFIELD, CAPE GIRARDEAU, MEMPHIS, BIRMINGHAM, PENNSACOLA, MOBILE, HOPE, PARIS, DALLAS, FT. WORTH, SHERMAN, OVERNOR, OKMULGEE, ANADARKO, OKLAHOMA, ENID, TULSA, MIAMI, CADDO, PLENO, ROGEE, PORT SMITH, TUPELO, FIELD, WICHITA, AVARD, OKLAHOMA.

**FRISCO
LINES**

ST LOUIS SAN FRANCISCO RY.

FRISCO FASTER FREIGHT

The Record

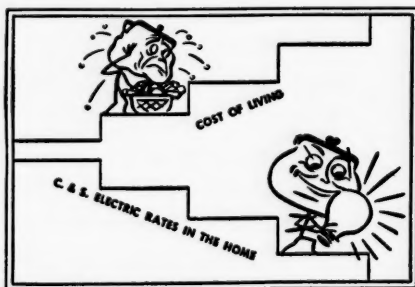
for **LOW** Rates and **MORE** Electric Service

LOWER RATES

The average rate for electric service in all homes in the United States during the year 1939 was **4.00c*** PER KILOWATT HOUR

Commonwealth & Southern's average rate for electric service in the home for the first three months of 1940 was **2.93c** PER KILOWATT HOUR

Our average electric rate for homes has long been about **25% BELOW** the national average



Ever since the Commonwealth & Southern system was formed, eleven years ago, we have steadily reduced rates. This has been accomplished in the face of all rising costs in living, and despite steadily mounting costs of labor and materials, and despite ever increasing taxes which we pay to Local, State and Federal governments.

AND MORE USE

The average home use of electricity throughout the United States during the year 1939 was **897*** KILOWATT HOURS

In Commonwealth & Southern system, the average home use of electricity for the 12 months ended March 1940 was ... **1226** KILOWATT HOURS

The average use in homes served by us has long been about **35% ABOVE** the national average



With the formation of our System, we began an aggressive policy of encouraging wider use of electric appliances for labor saving and more conveniences in the home. We made them easy to own.

Our Companies have been producing progressively larger quantities of electricity and have been making it available at progressively lower rates for many years.

We thus help to make the American standard of living the highest in the world and help to lighten the work of housewives in an ever growing number of American homes.

** These are the latest figures published.*

The Commonwealth & Southern Corporation

comprises the following electric operating companies

NORTHERN GROUP

Consumers Power Company (Michigan)
Central Illinois Light Company
Southern Indiana Gas and Electric Company
Ohio Edison Company
Pennsylvania Power Company

SOUTHERN GROUP

Alabama Power Company
Georgia Power Company
Gulf Power Company (Florida)
Mississippi Power Company
South Carolina Power Company

"Letters and Comments"

(Continued from page 7)

Industrial Expansion

Editor, MANUFACTURERS RECORD:

The American Lumber & Export Company, Birmingham, several years ago, subscribed to the Record and found it particularly valuable in furnishing information regarding building of and repairing industrial plants.

If the Record still furnishes this information, we would like to know to what extent, as we wish it to solicit inquiries for lumber from mills and contractors.

Under the new defense plans of the Government undoubtedly a lot of new plants will be built and others enlarged and we would like to be posted, so that we can go after their lumber business. We make a specialty of industrial lumber schedules.

DOLAN LUMBER COMPANY,
Augusta, Ga.

The MANUFACTURERS RECORD still carries as a regular feature each month (see pages 38 to 40 of this issue), details of the new industrial plants and expansions carried out in the South during the preceding month. In addition, as will be noted from the editorial on the front cover of this issue of the MANUFACTURERS RECORD, a meeting is to be held in Atlanta on June 10 when the MANUFACTURERS RECORD, cooperating with Southern governors and presidents of railroads, power companies, banks and industries, will seek a means of coordinating their efforts with the Government for the location and expansion of industries in the Southern states in accordance with the President's plan of national defense.—Ed.

* * *

Mineral Deposits of North Carolina

Editor, MANUFACTURERS RECORD:

Concerning your special issue, "The South's Resources," I want to call attention to the iron and copper deposits of Ashe County, North Carolina. I speak more especially of the magnetite iron ores of Ashe County. These ores, at many places—especially the Ballou or River Belt—are of the same type of ore I have seen from Sweden, while the Red Hill or Piney Creek vein is of the mangiferous magnetic iron ore. Then there is a third vein running through a section of the county which is referred to as a "specular" ore. All of these ores are remarkably free from phosphorus or other deleterious substances. Many samples of ore taken from various places in the county show above 60% iron. Manganese is present in the Piney Creek vein, ranging as high as 8%. The great ore-bearing fissure enters Ashe county near the Virginia state line at a point close to the junction of the North Fork and South Fork of New River and extends southwestward in three separate and distinct leads to Big Horse Creek, a distance of some twelve miles or more in length and about seven miles wide, occupying an area of something like one hundred square miles. Much prospecting work has been done in this field, demonstrating beyond question the unquestioned value of these ores. Tunnels have shown solid ore veins as much as 20 feet in width, square across the vein. It is only within the last few years that these ores could be purchased and the entire field brought together under a common ownership.

I would also call attention to the possibilities for hydro-electric plants along the streams of the county—in the heart of the iron field—are very fine and should be of interest to any one that might develop the iron field. The erection of hydro-electric iron furnaces is, in my opinion, worth consideration. I doubt if the South has a single undeveloped field that offers as great advantages as the Ashe County iron field.

R. L. BALLOU,
Creston, North Carolina.

The Division of Mineral Resources of the State of North Carolina advises the MANUFACTURERS RECORD that according to available records, Mr. Ballou "is surprisingly correct for such an optimistic booster and there seems to be no satisfactory reason why this has not been developed, except that people with money have passed our minerals by like the stream of California gold seekers passed by what is now Virginia City, Nevada."—Ed.

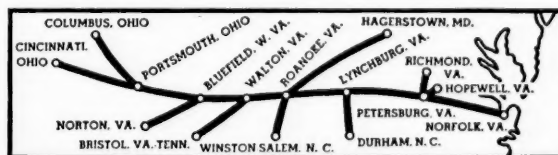
JUNE NINETEEN FORTY

Checked and O.K'd by

UNCLE SAM!



Norfolk and Western scales—ranging from huge track scales with capacities of hundreds of thousands of pounds to delicate precision scales that measure exactly the fractional part of a grain—are always kept in faultless condition. All N. & W. scales are checked regularly with the railway's Plate-Fulcrum Master Scale—one of only three in the United States. In turn, the Master Scale is checked regularly by experts of the United States Bureau of Standards and put under government seal. Thus, your freight is weighed with precision. It is handled with care and moved on time-saving schedules when shipped over the Norfolk and Western Railway... the route between the Midwest and the Virginias and Carolinas, and between the North and the South. Specify the Norfolk and Western for Precision Transportation.



NORFOLK AND WESTERN RAILWAY

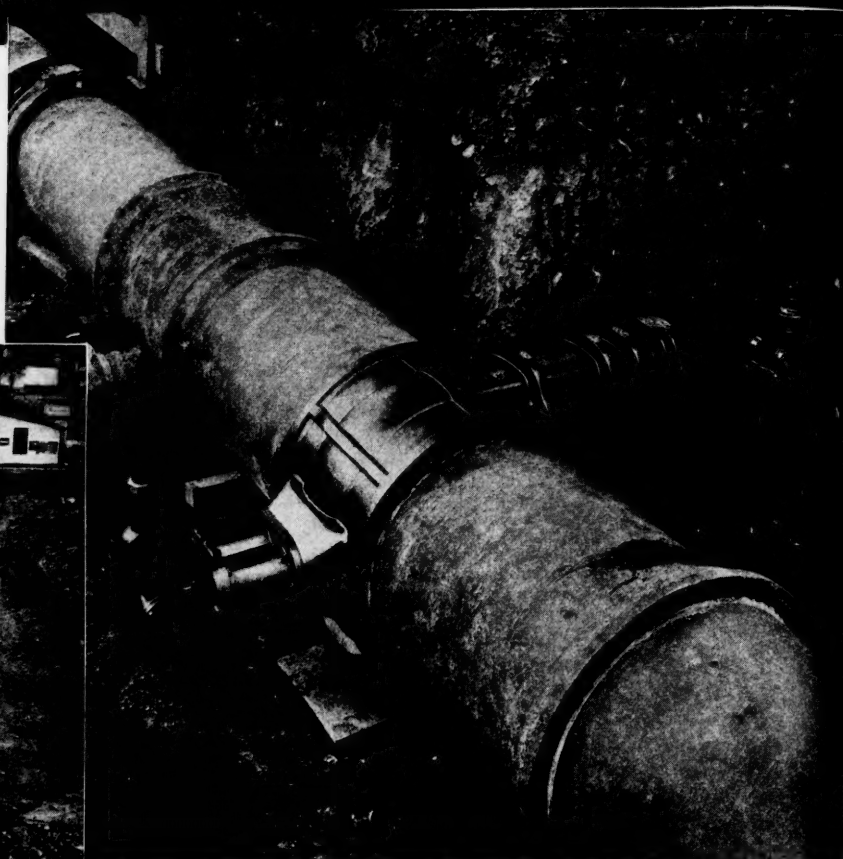
Precision Transportation

(COPY. 1940 N. & W. RY.)

READING R



(Below) 18,000 feet of 30- to 40-year old, 36-inch cast iron pipe, salvaged and relocated. An additional 18,000 feet of 24-inch and 30-inch cast iron pipe was relocated. Upon completion the entire relocated line was tested in sections at hydrostatic pressure of 150 pounds. Hazen-Williams coefficient averaged better than 150.



(Above) Reconditioned and relocated 36-inch cast iron pipe showing fittings and valve. After cleaning and coating the interiors with Bituminous coating, Hazen-Williams flow coefficients immediately after relocation, averaged better than 150 for both 36- and 30-inch pipe, in sections longer than 2,000 feet.

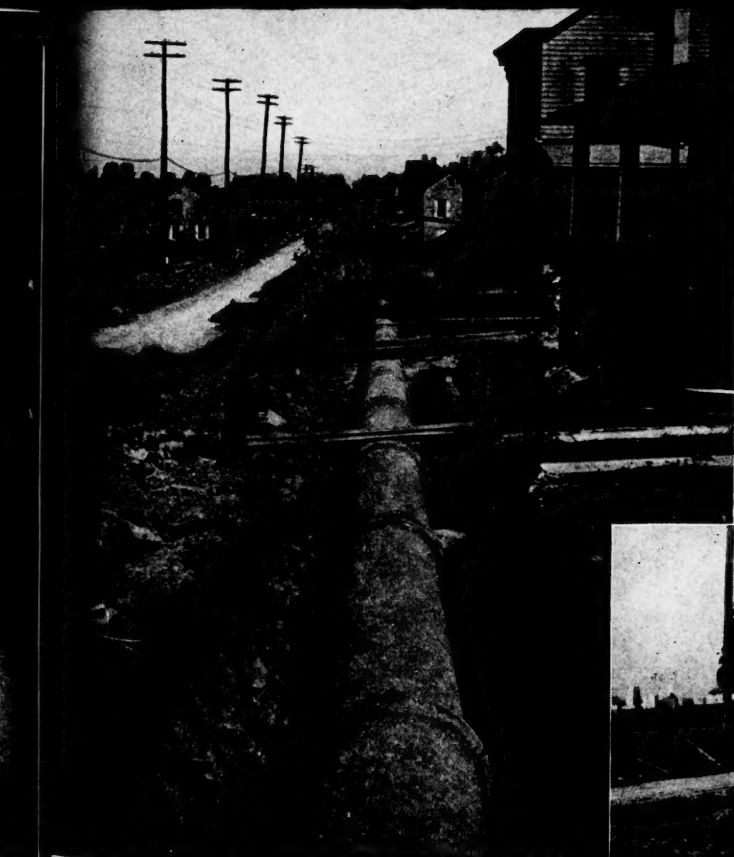
(Above) 10,
aged and re
(At right) 8
salvaged and

Loc
iron

G RELOCATES 7 MILES

and 24-inch and Salvages old mains ...

Mr. Heine's main problem was to relocate 7 miles of mains without interrupting the supply of water flowing into Reading and tapped by consumers along the Pottsville pike. The job was carried out with almost 100% uninterrupted service. Had the old pipe been abandoned, the estimated cost of 7 miles of new pipe would have been \$350,000. Salvage value, long life and low maintenance are the three major economies of cast iron pipe.



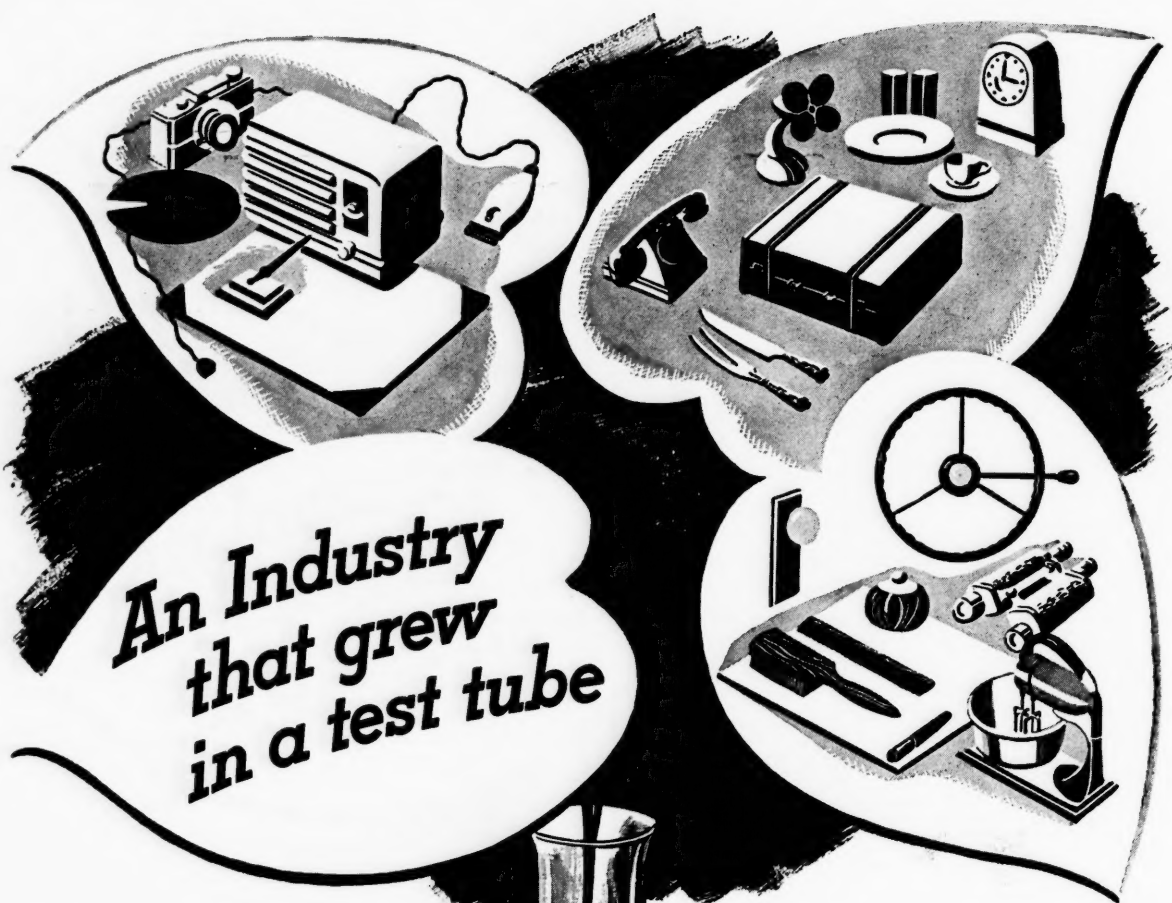
iron
coat-
dams
aged
ions

(Above) 10,000 feet of 51-year old, 24-inch cast iron pipe salvaged and relocated.
(At right) 8,000 feet of 51-year old, 30-inch cast iron pipe, salvaged and relocated.



Look for the "Q-Check" Registered trade mark. Cast iron pipe is made in diameters from 1 1/4 to 84 inches.

No. 1



**An Industry
that grew
in a test tube**

Plastics have progressed well beyond the experimental stage. These modern miracle materials take a thousand forms and shapes; have grown into a major industry that touches our everyday life.

The transparent fountain pen in your pocket, the steering wheel and fittings of your car; the invisible film sandwiched in your shatter-proof windshield; your radio cabinet; buttons, buckles and fasteners on your wife's clothes; dishes, luggage—countless other articles are moulded from this colorful material.

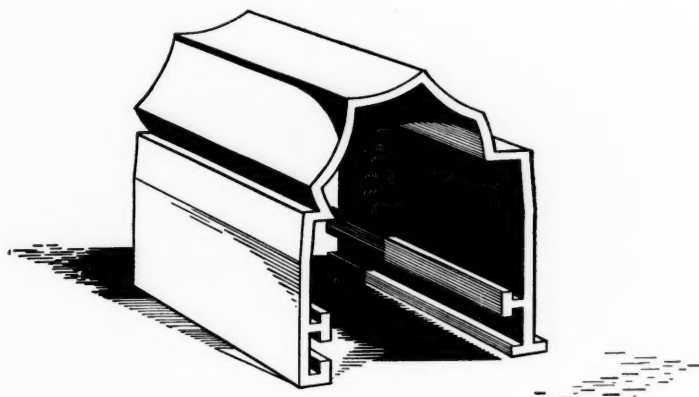
Today Southern factories turn out tons of

plastics used by many other American industries. As cotton, wood fibre, petroleum and the other basic ingredients of plastic manufacturing are plentiful in the Southern States the industry has grown and developed here.

Steel is necessary for this growth; steel for factories and warehouses; steel for machines; for tanks and pipes and transportation. Bethlehem's Maryland plant, on tidewater at Sparrows Point, is favorably located to supply essential steel materials promptly and economically to the plastic and other growing Southern industries.

BETHLEHEM STEEL COMPANY





THEY SAID: SQUIRT US EIGHTY FEET OF SHOWMANSHIP...

...We want to make good-looking store fronts possible for every merchant.

...We want them modern in appearance, and long-lived in city fumes. We need metal members curiously and wondrously shaped; strong enough even to hold big sheets of plate glass securely; precise enough to interlock and to be weather-tight; easy to install and to adapt to all sorts of conditions. And they must be economical.

And we said: Put down on paper your ideal of what the shape of these members ought to be, and forget your preconceived notions as to how metal can be manipulated. We'll squirt you your eighty feet, or eighty thousand feet.

Extrusion is what engineers call this amazing

thing we do with Alcoa Aluminum. They even say you extrude tooth paste from a tube; but you know you squirt it!

It is quite simple. We make a hole of the right shape in a die. We put some Alcoa Aluminum at the right temperature behind it. We push on the Aluminum with many thousand tons of pressure, and out comes the piece, as ingeniously shaped to the needs of the job as the one illustrated above.

Extrusion is another moneysaving way you can put the lightness and strength of Alcoa Aluminum to work.

It's a way we'd like to help you use, in your business, if you will but say the word. Aluminum Company of America, 2109 Gulf Bldg., Pittsburgh, Pa.

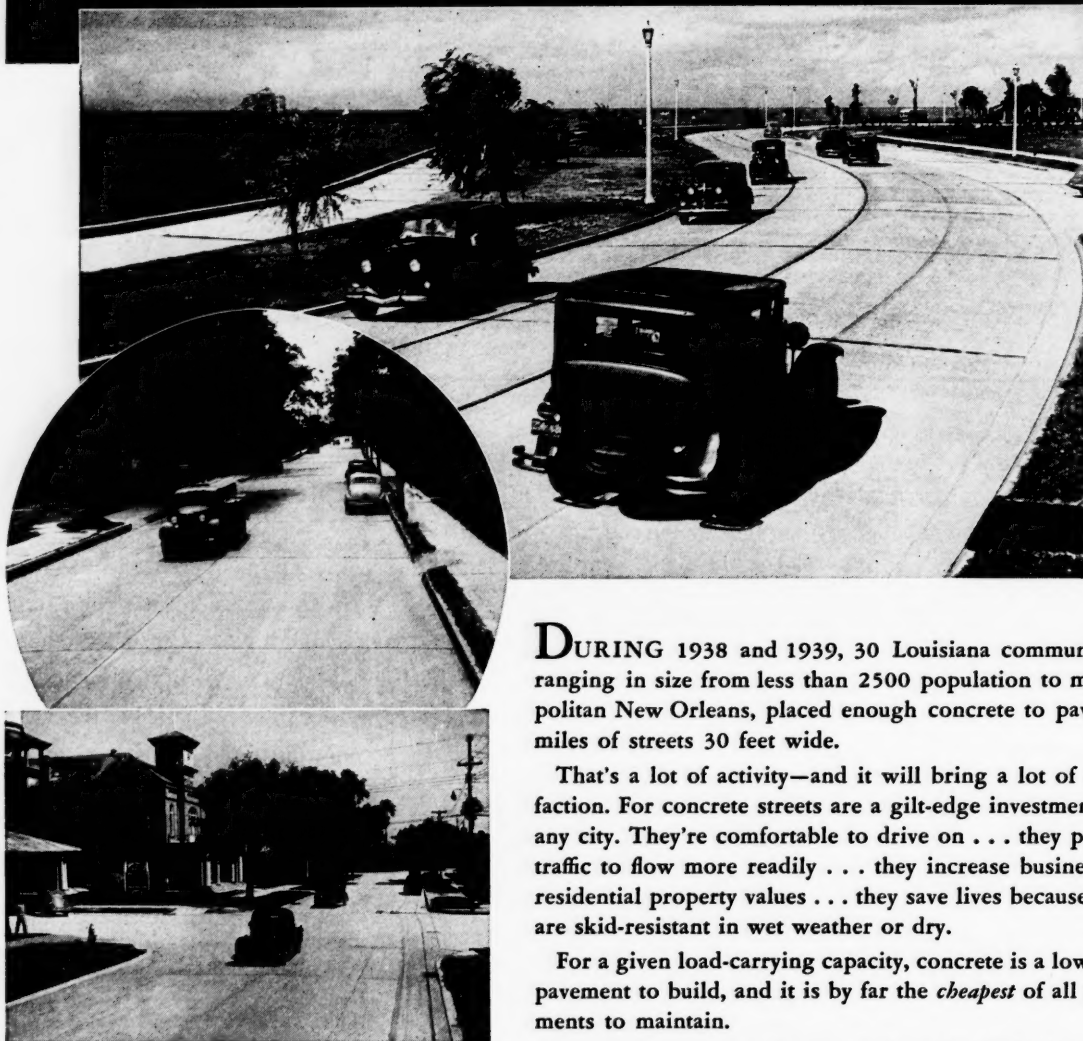


ALCOA · ALUMINUM

JUNE NINETEEN FORTY

13

In just 2 years, 30 Louisiana towns have placed 1,457,000 square yards of **CONCRETE STREETS**



(Top) Lake Shore Drive in New Orleans. A total of 467,796 sq. yds. of concrete built in this city in the past two years.

(Center) Residential Lawrence Street, Lake Charles, La., paved with concrete in 1938. Total of 154,582 sq. yds. built in past two years.

(Lower) First Street in Morgan City, La., which built 40,950 sq. yds. of concrete in past two years.

DURING 1938 and 1939, 30 Louisiana communities, ranging in size from less than 2500 population to metropolitan New Orleans, placed enough concrete to pave 83 miles of streets 30 feet wide.

That's a lot of activity—and it will bring a lot of satisfaction. For concrete streets are a gilt-edge investment for any city. They're comfortable to drive on . . . they permit traffic to flow more readily . . . they increase business or residential property values . . . they save lives because they are skid-resistant in wet weather or dry.

For a given load-carrying capacity, concrete is a low cost pavement to build, and it is by far the *cheapest* of all pavements to maintain.

Get extra service and extra savings by designing your city's streets for concrete.

PORTLAND CEMENT ASSOCIATION

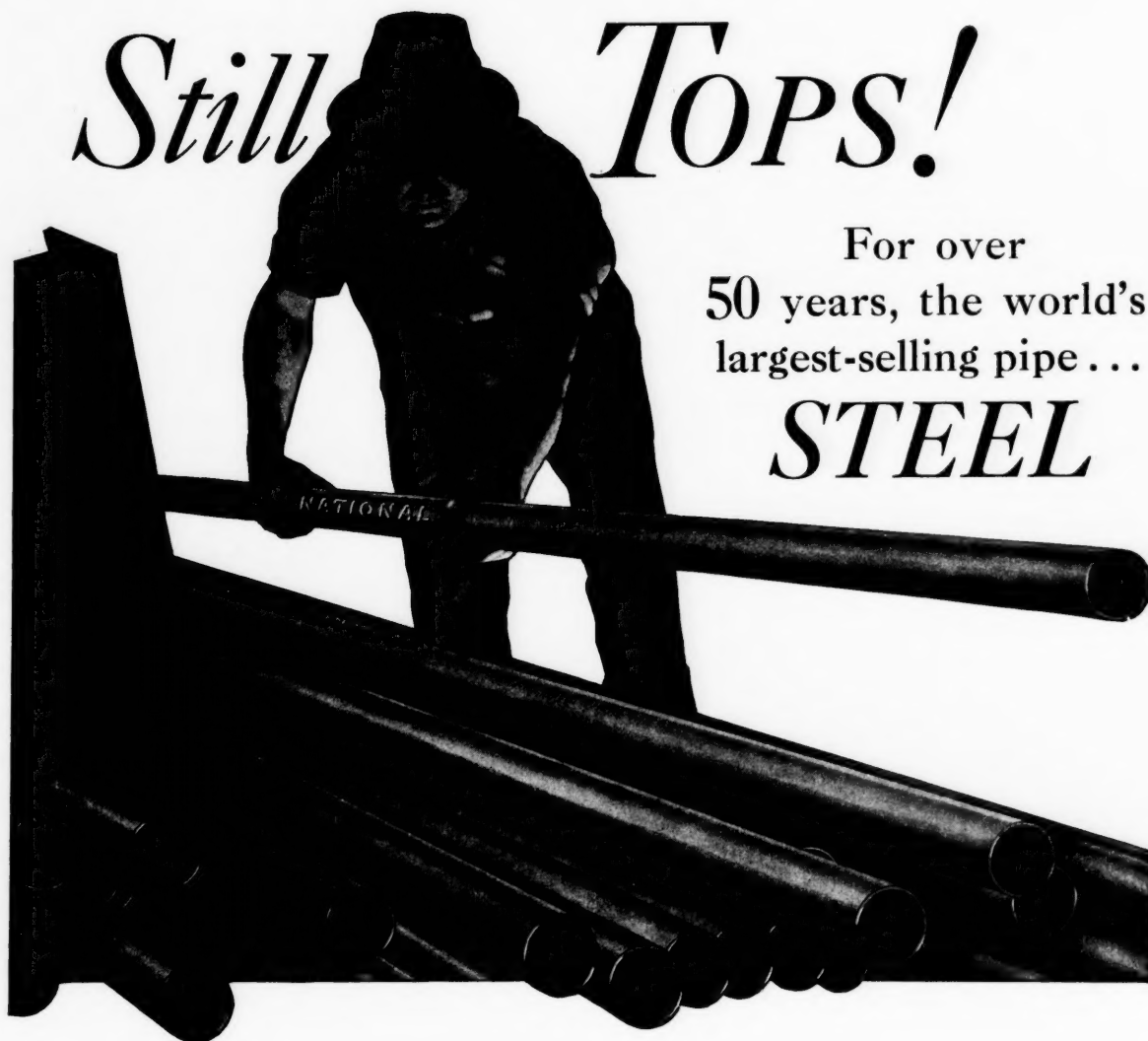
Dept. 6-21, 33 W. Grand Ave., Chicago, Ill.

A national organization to improve and extend the uses of concrete . . . through scientific research and engineering field work.

Still Tops!

For over
50 years, the world's
largest-selling pipe...

STEEL



FIFTY years ago, steel pipe was standard. Today, after half a century of service with plumbing and heating contractors, builders and architects, steel pipe is still the industry's standard. The world's largest-selling pipe.

Have you ever thought about what this consistent leadership means? Simply this—that steel pipe has always given builders the greatest service per dollar of cost for all-round use in all types of buildings. It means that no other pipe has ever been able to

offer greater value in strength, durability, and ease of installation at low cost.

Today's standard, NATIONAL Steel Pipe, though still fundamentally the same pipe that won the industry's confidence fifty years ago, is vastly improved to meet the requirements of modern heating, plumbing, and ventilating systems. It is uniform and ductile, easy to bend or coil, and readily installed. It easily takes sharp, accurate threads. It is clean, free of scale, and has a smooth surface for

paints or decorative coatings.

NATIONAL Steel Pipe today gives you more than ever before. Use it for all standard piping applications. It will give you greatest service per dollar of cost.

FOR EXPOSED PIPING

NATIONAL Copper Steel Pipe is recommended for soil, waste and vent lines, and other piping exposed to atmospheric conditions. A small percentage of copper added to the steel more than doubles the resistance of this pipe to alternate wetting and drying. Its extra cost is trivial when compared to the extra service it gives under these conditions.

NATIONAL TUBE COMPANY

PITTSBURGH, PA.



Columbia Steel Company, San Francisco, Pacific Coast Distributors • United States Steel Export Company, New York

UNITED STATES STEEL

JUNE NINETEEN FORTY

15

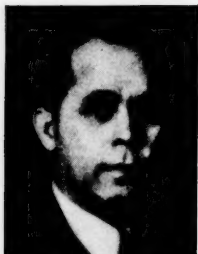


THE SOUTH

where NATURE'S 'PLANNED ECONOMY'
offers Opportunities to Industry



O. R. Hoos
GOVERNOR OF NORTH CAROLINA



Sam Jones
GOVERNOR OF LOUISIANA



Leon Cheeks
GOVERNOR OF OKLAHOMA



Fred McMane
GOVERNOR OF FLORIDA



Paul Keithman
GOVERNOR OF MISSISSIPPI



August R. Maybank
GOVERNOR OF SOUTH CAROLINA



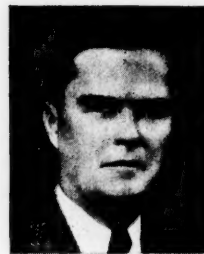
Prentiss Cooper
GOVERNOR OF TENNESSEE



Elwood Ransel
GOVERNOR OF TEXAS



Carl Bailey
GOVERNOR OF ARKANSAS



James A. Dineen
GOVERNOR OF ALABAMA



Carl Rivers
GOVERNOR OF GEORGIA
Chairman

WE, THE GOVERNORS... invite industrial leaders of the nation to consider the vast natural resources of the South.

Unlimited raw materials. The South produces 20% of the nation's pig iron, 17% of the hot rolled steel, more than five-sixths of the cotton consumed, more than five-sixths of the cottonseed crushed, 40% of the rayon, more than 68% of the fertilizer. The South also produces 100% of the naval stores, 100% of the sulphur, 50% of the bituminous coal, 60% of the natural gas, 60% of the crude petroleum, 100% of the bauxite, 75% of the Fuller's earth and 100% of the phosphate.

In addition to savings in shipments on raw materials, the South also offers strategic locations for plants serving the richest markets . . . A moderate, year 'round climate, affording lower construction and production costs . . . Cooperative, native-born labor . . . One-third of the installed hydro-electric power capacity.

Southern Governors' Conference

Bona Allen Building, Atlanta, Georgia

LAWRENCE WOOD ROBERT, JR., Executive Director

CARROLL DOWNES, Industrial Consultant



Call Scully AND RELAX!

"An order was received at noon Saturday," says our Newark Warehouse, "with request to deliver in Corning, N. Y., not later than Tuesday morning. It was for large C. B. Sections and was immediately shipped by railroad. It was at customer's siding in Corning on Monday morning before the plant opened. The customer was enthusiastic about the way his order was handled."

YOU can rely upon Scully to handle your orders promptly, accurately and cheerfully . . . whether large or small, regular or rush. So whenever you need steel or steel products, copper or brass, put it up to Scully and know that you'll get prompt action. Thousands of customers have learned that Scully Service is the same at each of our eight conveniently located warehouses. They all

operate on the principle that our customers want immediate service and friendly contacts — and they always hurry whether you ask it or not. And when you say "Rush" they know you mean it.

Why not try Scully Service? Phone, write or wire the warehouse nearest you. And ask for our complete and handy Stock List and Reference Book. It's free.

We have big stocks on hand NOW . . . for immediate delivery


SCULLY STEEL PRODUCTS COMPANY

Distributors of Steel, Steel Products, Copper and Brass

Warehouses at **CHICAGO • NEWARK, N. J. • ST. LOUIS • BOSTON**
ST. PAUL-MINNEAPOLIS • CLEVELAND • PITTSBURGH • BALTIMORE

UNITED STATES STEEL


JUNE NINETEEN FORTY



The Mark of Service

ALLOYS
ANGLES, HOT ROLLED and COLD ROLLED
ARCHES (CORRUGATED)
BABBITT
BANDS and HOOPS
BARS, HOT ROLLED
ALLOYS (HR and CF)
COLD FINISHED
ELECTRIC HIGH CARBON STEEL
REINFORCING
BEAMS and C. B. SECTIONS
BEEF RAIL
BOLTS, NUTS, WASHERS, ALL KINDS
BORING and TURNING BARS and GRINDERS
BRACES, BOILER
CHAINS, ALL KINDS
CHANNELS
CHISELS
CHUCKS, STAYBOLT
CLAMPS, BOILERMAKERS
CLIPS, PATTERSON
CLEANERS, FLUE
CONDUCTOR PIPE
COPPER and BRASS
COUPLINGS, HOSE
CRAYONS, SOAPSTONE
CUTTERS
DANDELET RIVET and MACHINE BOLTS
DRILL RODS
EAVE TROUGH and FITTINGS
EXPANDERS, FLUE
FERRULES, COPPER
FLANGES, BOILER and TANK
FLOOR PLATES
GALVANIZED SHEETS, BARS, BANDS
HANDLES, HAMMER
HEADS, TANK and FLANGE
HOISTS, HAND and POWER
IRON, STAYBOLT
LUGS, BOILER, TANK and SILO
MACHINERY, HAND and POWER
MANHEAD PLATES and FITTINGS
NAILS
PAINT STICKS
PLATE STEEL, STANDARD QUALITIES
ABRASION RESISTING
COR-TEN and MAN-TEN
PLUGS, FLUE
RAILS and FITTINGS
REAMERS
SHAFTING
SHEETS
ABRASION RESISTING
ELECTRICAL
COR-TEN and MAN-TEN
HOT ROLLED and UNIFORM BLUE
WELLSVILLE POLISHED
COLD ROLLED
STAINLESS STEEL
GALVANIZED and GALVANNEAL
LONG TERM
CORRUGATED
U-S-COPPER STEEL
SPRING STEEL BARS and SHEETS
STAINLESS STEEL
STRIP STEEL, CR and HR
TEES
TIRE, ROUND EDGE
TOOLS, HAND and POWER
for BOILER and IRON WORK
TROLLEYS
TUBES, BOILER
TURNBUCKLES
VALVES, BLOW-OFF
WELDING ROD and WELDERS
ZEES

The Mark of Quality



NEWS FOR EXECUTIVES IN TODAY'S BURROUGHS DEVELOPMENTS

FOR SAVINGS BANKS

A simple, compact window-plan machine for posting passbook and ledger; priced far below any other window-plan machine ever offered.

FOR DISTRIBUTORS

A development that greatly simplifies obtaining statistics, and making settlements by routes, territories, etc.

FOR BRANCH OFFICES

A machine that produces branch office accounting records of sales, collections, etc., and provides copies for the home office in the same writing.

FOR SMALL-LOAN DEPARTMENTS

Compact machines that simplify scheduling of payments as well as posting to passbook and ledger.

FOR RETAIL STORES

A low-cost cash register that effects new economy in certifying sales tickets; better protection to customer, store and clerk.

FOR SMALL MANUFACTURERS

An accounting machine so flexible that it handles all payables, receivables, distribution, labor accounting, general ledger, and other records with equal facility.

FOR STATISTICAL DEPARTMENTS

A distribution and statistical machine with many time-saving features for obtaining statistics on sales, purchases, expenses, etc., at less cost.

• • •

The above are only a few of the many recent Burroughs developments. For news about the savings that Burroughs can help you make in your office, telephone the local Burroughs representative. Or, if you prefer, write direct to

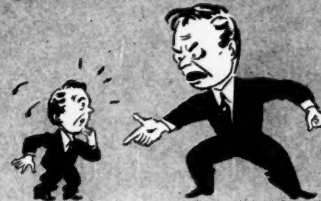
BURROUGHS ADDING MACHINE COMPANY
6162 SECOND BLVD., DETROIT, MICHIGAN

Today's Burroughs

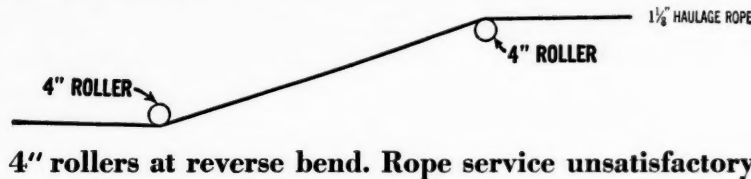
DOES THE WORK IN LESS TIME—WITH LESS EFFORT—AT LESS COST

WHO SAID

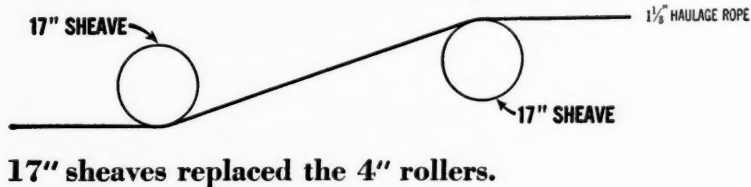
"Wire Rope Reeving Isn't Important"?



BEFORE



AFTER



RESULT

Rope Service almost Doubled!

This is an *actual* case history. Not an isolated case. But a typical example of what can be and is being done to increase rope life through proper wire rope reeving.

There is nothing complicated about proper wire rope reeving. It's simply a matter of watching the things that are easily overlooked—avoiding reverse bends whenever possible, making sure that sheaves are large enough, that sheave grooves are in proper condition, etc. The additional examples

to the right are typical of what can be done. And they pay big in results.

To obtain maximum safety and service from wire rope—watch wire rope reeving. And feel free to consult our local representative—who will gladly make available to you our years of experience with every conceivable kind of reeving problem. His suggestions may point the way to worthwhile savings.

JOHN A. ROEBLING'S SONS CO.
Trenton, N. J. Branches in Principal Cities

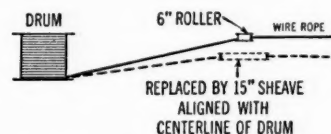
This advertisement is published in the interest of all wire rope users, to help them obtain greater safety, service and efficiency from their wire rope.

ROEBLING

Wire Rope



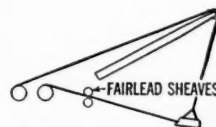
SOME OTHER "REEVING POINTERS" THAT INCREASE ROPE LIFE



These simple changes doubled rope life!

Originally, a 6-inch roller was used, as indicated above, in reeving a hoist. First of all, this roller was too small—causing a sharp bend in the wire rope. Secondly, it was improperly aligned—causing scrubbing action of the rope on the drum. As a result wire rope life suffered.

By simply replacing the 6-inch roller with a 15-inch sheave, and properly aligning this sheave, as shown, excessive rope wear was eliminated. Wire rope life was doubled!



Dragline sheaves replaced—rope life tripled!

An Illinois coal company replaced worn Fairlead sheaves with larger sheaves of harder material. Result—average service of five ropes almost tripled that of five ropes used before.

Ask about ROEBLING "BLUE CENTER" WIRE ROPE... either standard or preformed



AKLO GLASS

**...STOPS HEAT
...REDUCES GLARE
...LOWERS MAINTENANCE**

MAKE THIS SIMPLE "BUCKET TEST"



Place two buckets filled with water of the same temperature in an exposed sunny spot. Cover one with a sheet of ordinary figured or wire glass, the other with a sheet of AKLO. After several hours, take the temperature of the water in both buckets. The water under the AKLO Glass will be considerably cooler because AKLO keeps out most of the sun's heat. The Glare Test is even simpler. Hold up the two samples of glass used in the bucket test to the sun. Your own eyes will give you the answer in favor of AKLO.

● If there were such a thing as transparent asbestos . . . sun glasses large enough to cover your plant windows and skylights, these two would accomplish expensively what Blue Ridge AKLO Figured and Wire Glass does inexpensively and far more efficiently.

AKLO Glass stops Solar Heat—it absorbs practically all of the infra-red (heat) rays of the sun. Think of this in terms of increased worker efficiency or lower cooling costs.

AKLO Glass reduces Glare. Consider this AKLO feature on a basis of increased production—better hand and eye coordination on the production line.

AKLO Glass lowers Maintenance Costs. No windows or skylights to whitewash or paint—and perhaps you may have overlooked this item of expense.

Get the full story on AKLO. A five minute walk through your plant will bring to light many places where AKLO Glass will pay dividends. Ask your local L·O·F Glass Distributor to give you all the facts or write Blue Ridge Sales Division, Libbey·Owens·Ford Glass Company, Toledo, Ohio.



BLUE RIDGE AKLO GLASS

HEAT-ABSORBING, GLARE-REDUCING, THERMAL SHOCK-RESISTING FIGURED AND WIRE GLASS

Blue Ridge AKLO Glass is a blue-green, low expansion Figured or Wire Glass that absorbs practically all of the infra-red (heat) rays of the sun, substantially reduces glare, and at the same time admits adequate daylight.

MANUFACTURERS RECORD FOR



MEN OF PROVEN ABILITY NEEDED

The attention of America is centered upon Europe's war as the tide of battle ebbs and flows.

The effort to conquer democracies, overthrow the capitalistic system and make all men creatures of a totalitarian state has plunged millions of human beings into the horrors of what promises to be the most disastrous war of all history.

The ground has been well prepared while peaceful nations slept. The ploughing and sowing of insidious propaganda preceded by years the appearance of mechanized military might counted upon to reap a ghastly harvest.

Hitler's blitzkrieg through the low countries and Northeastern France has startled America out of an attitude of complacency and indifference. The people, as well as many of their representatives in public office, have come to realize apparently for the first time that democracy and all it stands for are in peril. This country may or may not be in imminent danger of attack, but there can be no dissent from the advocacy of adequate military preparedness presented in the President's message to Congress.

The problem, however, requires a sane, calm approach for its solution in place of the hysteria shown in some of the suggestions so far made for preparedness. Billions are to be spent for airplanes, ships and shore defenses, arms and factories for outfitting a great army. With this in view it is paramount to study how the work may be done most effectively and with the least possible loss of money and time. America is capable of great accomplishment, but it is well not to be swept off our feet in too great a rush if we are to avoid the waste and ineffectiveness of the last war.

Whatever the emergency, the need is for competent thought in developing a program. The call should go out at once for men of brains and capacity experienced in the methods of industrial organization, in purchasing and manufacturing and shipping, that an orderly course may be followed. Such men should determine how the vast sums appropriated are to be spent and the hands through which they should pass. There is no evidence from the record of the last seven years that the New Deal is qualified to administer the tremendous industrialized effort necessary to accomplish what the President recommends. The emphasis of the New Deal always has been laid on the need of social reform and not on the vital place industry occupies in America's welfare.

Among the industrial leaders of this country will be found the brains for organization and production to meet the emergency. It is essential, without regard to politics or pride of office, to call upon such men who can be counted on to give their time and brains to the country's need. Speed we need, but not at the cost of confusion and panic.

Importance Of Small Industries

In the industrial development now taking place in the South, there has been a natural desire to attract industries that will use in a large way the abundant resources that are available. Such industries with their thousands of employes increase the sales of local merchants, provide a market for the farmers of adjacent territory, contribute largely to the local tax budget and in most cases are altogether desirable.

It is well to remember, however, that in the industrial fabric of America, there has been interwoven a great variety of small industries, the desirability of which too often has been overlooked in the effort to get the bigger plants.

The papers of South Carolina have been stressing the value of small industrial establishments which by their number and the variety of their products not only utilize the resources of the state and can be moved more easily if they come from other places, but which in most instances can be developed through local capital and initiative.

Home industries are what started America on the road to manufacturing success. Work done in small plants and oftentimes in the home by human hands developed the skilled artisans of a day when standardized production and automatic machinery were unknown. Small plants supply needed products to larger ones. The large automobile manufacturers give business to thousands of independent establishments making supplies.

There is a small plant in a Southern state employing perhaps a dozen men—machinists who are known for their skill and careful workmanship. All during the depression, because of the excellence of the work turned out, that plant has been busy not on government contracts, but on private work which comes from large cities oftentimes hundreds of miles away. And there are many such in every state, in many lines of business throughout the union.

Local banks and local business men in the South will do well to encourage the starting of similar industries in their own community, through the aid of local capital.

The South In Summer

The Seaboard Railway calls attention to the fact that 149 hotels will remain open this summer at Miami Beach.

In planning for a large summer vacation business, the Seaboard has placed in service four daily Diesel electric trains to the South.

Among those who are not familiar with the Southern climate, there is a popular misconception regarding summer heat in this section. Many years ago the writer, attending a meeting at the old Waldorf in New York when the weather was insuf-

ferably hot, met Charles R. Capps, then Vice President of the Seaboard Air Line Railway. Inquiry brought the information that Mr. Capps was on his way to Sarasota, Florida, and of all things, to get cool!

This veteran railroad man who had spent the greater part of his life in traveling and might be expected to know where coolness could be found in summer was hurrying to the tip of Florida to cool off.

Mrs. Potter Palmer who had her home at Osprey Point near Sarasota, where she was developing 67,000 acres of land, found the climate to her liking the year 'round and her opportunities for knowing climates of many lands had exceeded that of most of us. Her aunt, Miss Honore, built a commodious home on the Florida coast and declared it to be superior from standpoint of climate to that of any other coast, and she had been to most.

The heat of the South is longer than in the North, but the thermometer never rises to degrees reached in the North, and sunstroke in most of the Southern states is virtually unknown.

Agricultural Exports

The factors responsible for the high level of cotton exports during the first 6 months of the war in Europe include the virtually exhausted state of foreign stocks of American cotton at the beginning of the period, the relatively high level of cotton-mill activity in Europe, and the fear that, as the war advanced, shipping difficulties might bring about a further increase of freight and insurance rates.

During much of the World War, foreign demand for cotton was relatively low. Although cotton is used extensively in war materials, civilian consumption in wartime is usually greatly reduced; so that there is little reason for expecting an unusually high foreign demand in the immediate future. Since January, cotton exports have been decreasing rapidly.

Contrary to expectations of last September, the war has caused United States exports of farm products to be substantially smaller than they otherwise would have been. Actually, exports during the first quarter of 1940 declined to \$56 million from \$85 million in the corresponding period of 1939. Also contrary to some expectations, the war has had little effect on United States imports of agricultural products.

Perhaps the greatest factor in this development has been the centralized control of economic life established by the Allies for the purpose of conserving foreign exchange and other international assets. In carrying out this control, the Allies have acquired from countries which would otherwise have sold them to Germany, considerable quantities of agricultural commodities of types either exported or imported by the United States. They have also

discouraged all other imports except those absolutely essential and have kept prices of these at a minimum. Furthermore, the Allies are purchasing from British colonial countries as much as possible since this does not involve present payment in foreign exchange.

Added to the effects of these controls on United States agricultural products must be included those of the Allied blockade which has kept our products out of Germany and German occupied territory. To the latter must now be added Belgium and the Netherlands which jointly purchased 45 percent of U. S. wheat exports, 41 percent of our exports of western fire cured tobacco, and over 60 percent of soybeans during the six-month period, September 1939 to March 1940.

Tobacco exports during the first 6 months of the war were only slightly more than half of their volume a year earlier. With stocks on hand equal to two-and-a-half years' supply, the United Kingdom practically ceased purchasing tobacco on the outbreak of the war. This has been the principal factor in the decline. There was some expansion in exports to European neutrals but these countries are only minor markets at best.

Some other commodities, exports of which increased during the war months, are dried peas, dried beans, horses and mules, canned fruit, sugar, potatoes, cornstarch, glucose, and hops. The increases in several of these items may be attributable to the effects of the war, but none of them is large in comparison with the decreases in our leading farm exports.

Ford Motor Company a Buyer of Southern Products

That the industrialists of America are becoming more and more aware of the opportunities the South affords for development is shown by a letter from Edsel Ford of the Ford Motor Company in which he states:

"Our Company fully realizes the industrial development which has occurred in the South, and naturally is grateful for having shared in it.

"We have branches located at a number of points throughout the South; namely, Alexandria, Atlanta, Charlotte, Dallas, Houston, Jacksonville, Louisville, Memphis, New Orleans, Norfolk and Oklahoma City, and at the present time we are placing contracts for expansion of our Dallas branch involving an expenditure of about \$350,000.

"In the above group of branches we have a total of more than 7,000 employees.

"I thought this information might be of interest to the Governors' Conference group and the MANUFACTURERS RECORD, and may further add that in 1939 the Ford Motor Company purchased from

concerns located in the Southern states materials costing approximately \$14,000,000."

Defense Without Politics

Some of the names announced by the President to form the Advisory Defense Committee have not impressed the public from their past records with their competence to deal with the tremendous program supposed to be immediately gotten under way. It is a time to lay aside every consideration, if the emergency approaches the seriousness that the White House believes, save immediate prompt and effective action regardless of politics to secure the best results for America.

Otherwise it will be the same story over again—taxation in increasing amounts; (the debt limit Congress agrees must be raised to \$48 billions), followed by the same lack of results we have had from previous spending.

Henry Ford says "without meddling by government agencies," but with the advice of experts, he can turn out 1,000 planes a day if given six months' time. Why is not an industrialist of that type called upon to advise and coordinate and do? Such men, if let alone by the politicians and the theorists, will astonish the world with their effectiveness.

The industrialists of America who have contributed so largely to the wellbeing of this country are as one in their patriotism. They will sacrifice and work for America's defense but they will be handicapped if compelled to listen to theorists and the political adventurers, actuated too often by selfish reasons even in a time of stress.

The Allies' Vital Need

In emergencies it is necessary at times to change rules that ordinarily govern. The war in Europe engrosses America's thought because of its horror and the realization which has finally come that democracy is at stake. If the Allies lose, this country will be virtually alone as the remaining stronghold of individual freedom.

The Allies are fighting for the preservation of principles that we hold as priceless. Whatever they need to win which we can supply should be furnished with all promptness. One of the things necessary for their success is credit, and Congress will do well to change the rule that money must not be lent to England and France even if they have failed to meet their previous obligations.

Even if it is never paid, even if we should make a gift of the amount necessary to enable the defenders of freedom to win—the freedom which Americans prize above all things—the price would be cheap. We believe the people of America would be willing to bear any financial loss involved.

The issue is too vital to hesitate.

SOUTH BIDS TO SHARE IN DEFENSE EFFORT

The following article reflecting opinion in Washington discusses defense needs from various angles. The MANUFACTURERS RECORD knowing the unequalled resources of the Southern States anticipates possibilities here noted becoming actuated.

The South possesses virtually every factor necessary for the advantageous prosecution of an industrial expansion program designed to meet this country's defense needs—a program that will include every one of the South's sixteen states.

During 1938 and 1939 the MANUFACTURERS RECORD published a series of maps and articles presenting in graphic form salient facts concerning the industrial opportunities of the South. This series with supplementary material is now being revised for early publication in one volume. Meanwhile, a few reprints of the original maps are still available for those seeking this essential information of the South.

Other vital information regarding the South's resources appears on page 28.—Ed.

REPRESENTATIVES of Southern and Southwestern states, both in Congress and among civic and municipal groups, have moved promptly to insure that the advantages of this area receive full consideration when the Government or industry chooses locations for so-called "shadow factories" and other expanded plant facilities for augmenting American aircraft output and other defense equipment contemplated in the current emergency program.

The fundamental requisite laid down so far is that such vital production shall be sited inland, as far removed as practicable from the liability to sudden destruction by air, or any other forms of blitz warfare recently demonstrated abroad.

For the guidance of interested groups it can be stated that a War Department board probably will be created shortly, to be responsible for actual decisions on suitable locations. It is also regarded in Washington as very likely that a definite building program will be blocked out, in conformity to plans indicated as necessary under emergency legislation being enacted as this is written.

Initially, such expansion probably will aim at increased aircraft output. A strong body of opinion in Washington holds that such auxiliary facilities cannot be started too soon, in view of developments abroad. Secretary of Treasury Morgenthau told a recent conference of aircraft manufacturers that it would be the policy first to give industry every chance to meet defense needs.

He did not indicate further when the

Government would take positive action. When additional building is launched however, the Government must consider several questions;

Will the additional plants be privately built and privately operated, perhaps with Government financial aid;

Will they be Government built, for private operation;

Or, will these plants be Government built and Government operated.

Some combination of the three policies is held entirely possible. Existing plants actually engaged in major production are held by the Secretary to have ample capital available. The Federal Lending Corporation it was also indicated, might assist others not coming in this class.

While demand for additional Army and Navy aircraft dominates the proposals at this stage, the expanding national defense program in all its branches points to a proportionate acceleration of other munitions production, together with augmented research centers and increased storage construction. The pre-requisite that all such new installations shall be located in strategically safe, as well as industrially efficient areas is the factor on which Southern and Southwestern sections hope to capitalize.

As Rear Admiral John H. Towers, chief of the Navy's Bureau of Aeronautics expressed the situation from his service's standpoint;

"We would rather not see too many of our industries, engaged in munitions, concentrated in one area; on the other hand there are certain areas that have advantages insofar as the labor market is concerned, and availability of materials."

Spokesmen for Southern states, and groups in this area interested in the matter, have uniformly refrained from a purely sectional or partisan political approach, emphasizing that they see this development in its broader national aspect.

They intend to actively interest themselves in presenting the advantages of their respective states or sections; that is, the abundant raw labor, which they feel is as readily adaptable to the requirements of skilled production as similar groups of workers in other localities; the availability of dependable, more highly

trained labor, as well; and the existence of numerous small production units capable of conversion or expansion for the purposes of national defense.

In accordance with the usefulness of these qualifications, and the distribution of essential raw materials, transportation, and other requirements, and in fair ratio to other sections of the country, it is their hope that the South and Southwest will be given an opportunity to participate in the emergency effort. However, they make it plain that the merits of other areas are recognized, as well as the claims of the latter to consideration.

One outstanding qualification of the South and Southwest generally, which is advanced in favor of this region, is the prevailing climate which makes all-year production possible. This natural advantage, they believe, may well offset certain more tangible claims of other states, even within the inland group to which such construction apparently is to be restricted.

Certainly the considerations which an expert indicated to this writer, may be expected to influence the choice of locations for any additional plant space and emergency defense production, would give the South and Southwestern areas many strong claims.

These factors, not necessarily in the order of their importance, are:

Geography; an inland area, preferably intermountain, is a prerequisite;

Transportation; both land and water facilities probably will be needed;

Proximity to raw materials;

Availability of skilled labor;

Nature of the community; this requirement is closely identified with the labor requirement in several respects, and has other defense implications as well. For example, the community should not contain any hostile elements, or subversive influences, for obvious reasons where defense activities are involved.*

It should, naturally, have a good labor history, that is, free of strike troubles, both as to past record and present situation. At the same time it is considered desirable that the community's labor groups be reasonably stabilized as to organization, to preclude any new crop of disturbances incident to fresh organizational disputes or employment tie-ups which might delay vital work.

*It should be noted that the white population of the South comprises over 98 percent American born.—Ed.

Financial stability, while important, is fairly well assured by the readiness of Government lending agencies to assist communities or local industries in expanding their capacity for industrial output under the current demand.

Power is another prime essential which might almost be ranked first.

Analysis of these fundamentals will give any reader familiar with the South almost a summary of what many Southern and contiguous states, have to offer as possibilities for expanding production in their territories; homogeneous populations, conservative labor attitudes, with adaptable, willing workers and progressive but not extreme organization trends.

Geographically most such states are inland. Ample power is available from varied dependable sources, coupled with rail and water transportation in many instances besides offering the advantages of being old, settled communities with substantial business and civic groups.

Many of the essential raw materials for various munition requirements are possessed by the South and Southwest both developed, and in unexploited quantities. Further, these sections possess still another claim under a requirement that will have much weight; plants and producing units which are easily convertible from present production to strategic operations.

Most of the qualifications listed apply primarily to future aircraft production sites. However, the characteristics offered by South and Southwestern regions suggest that additional output of munitions might well be extended to their states. For instance, it is known that some further building for chemical plants, for one of which \$44,000,000 already has been earmarked, storage, or loading plants, and expanded arsenal facilities will be necessary. Some sites for these have been tentatively determined, but for various reasons cannot be announced at this time.

The South and Southwestern areas happen to possess what is at this stage, a very fortunate combination of ample power supplies and abundant essential materials. This is so because many ores, chemicals, and kindred products have been found in this region which are only now becoming available in practicable quantities because electricity has opened new means of development of these deposits.

Many studies have been made in recent periods to determine what minerals, ores and chemicals are at hand in these sections, as well as means of making them available for emergency or commercial use. Some of this research has been conducted by State experts and the Federal Government. This research covers supplies and technical processes involving aluminum ores, various components of metals, plastic materials or components; acids, chemical items of many types, and

their conversion to various uses, such as phosphates, sulphur compounds, and others.

The Navy Department has found, for instance, that the new substance "nylon" is the next best thing to silk for its gun powder containers, though the Navy still uses silk. Textile mills are easily turned to other allied products, it has been found; carbon plants, coke mills, and a score of other units all enter the picture.

While it is likely that a War Department Board will assume jurisdiction of many problems involved in selection of new plants or extensions of old ones, much will hinge on some of the policy considerations mentioned earlier. If private plants are left to increase their own facilities, with their own capital, they naturally will go where it suits them best.

The Government will be influenced by various considerations, not necessarily political however, but which will perhaps not be present in the case of private operations. One instance of actual expansion which has occurred illustrates some of the situations that may arise;

The Carnegie Steel Company, the Bethlehem, and Midvale Steel Companies, have been engaged in supplying armor plate to the Navy. Under the rapidly increasing demands from the Navy some plant expansion has been necessary. It was estimated that some of the additional facilities required would have necessitated a delay due to the lapse of 18 months to two years while these were being built. Further, the location of certain plants was such that space for additional factory or mill area was not at hand. Other buildings, or sections of town were crowded against the plant walls.

The Government was given \$1,000,000 by Congress to put in usable condition certain parts of the old World War Navy armor plant at Charleston, West Virginia. Through expenditure of part of this amount, the old plant's 21 furnaces and reheating furnaces, together with a number of buildings, were made ready and Carnegie Steel Company arranged to rent them and thus meet its need for increased capacity, without having to build its own structures.

In passing, it is claimed that the Navy thus gets a certain rental for this plant, is getting its needed armor at a saving in time, and also money, on the basis that the other two plants also had to expand, and the Government helped pay for this increase.

The Government has made some slight progress previously toward plant expansion. It will soon have the torpedo plant at Alexandria, Va., in operation as an extension of the Washington Navy Yard facilities; the Navy's nitrate plant at Indianhead, Maryland, is now being made ready for operation this summer. This suggests that nitrates formerly came largely from Chile, and are now being ex-

tensively produced by chemical companies in the United States which are enlarging to meet increased demands.

In such activities, as well as the development of other materials, metals, alloys, and products such as tubing for various armament purposes, are seen opening for Southern industry. Southern shipyards have recently been ordered, along with those of other sections, to go on double shifts, increase their civilian personnel, train additional workers, and otherwise speed up this particular part of the defense modernization.

The labor question is particularly involved in Southern sections, because of possible shifts in production under this projected increase. There are apparently two schools in Washington, one expressed by Secretary Morgenthau when he told questioners that there is no intention of altering labor standards, although discretionary power exists in some cases; and the other, represented in definite legislation modifying the wage and hour and labor relations provisions hitherto in force, on certain types of national defense work.

Summarizing, it appears at this stage that the Government will first increase existing facilities at its own works such as the small arms arsenals and chemical or technical posts, then sublet certain types of manufacture to private plants adapted to absorb such overflow in these products; it will increase, or assist private plants to increase, their capacity on airplane or other defense items when needed; and finally, will add plants of its own for various of these purposes. As stated, there are indications that some move in this latter direction may be started at once, without waiting for any difficulty to arise at a crucial moment.

Further, due to the insistence of the President, as well as his technical advisors, as far as practicable, additional facilities are to be located inland. As various spokesmen indicated to this writer, Southern interests have been alert to the opportunities suggested by this projected program. Without seeking sectional or selfish advantage, they are acting as far as developments now permit. At the same time other parts of the country are equally interested, and a number of inquiries are known to have been made in Washington from these various quarters.

A glance at the map discloses that a substantial area of the South and Southwest comes within the inland limits visualized by those who foresee the possibility of threats from abroad to more exposed coastal sections. In addition to any other plant expansion contemplated, Federal Loan Administrator Jesse Jones, as this is written, has suggested a bill to Congress, to facilitate his organization's functions in financing, or assisting private agencies to finance, industry seeking

(Continued on page 58)

"FACE-LIFTING" WITH STRUCTURAL GLASS

BY

Earl Aiken

Libbey-Owens-Ford Glass Company

THE South, long a reservoir of raw materials which have been shipped to other sections of the country for processing into modern products, has been slow, it is charged, not only in fabricating its own natural resources but in utilizing them.

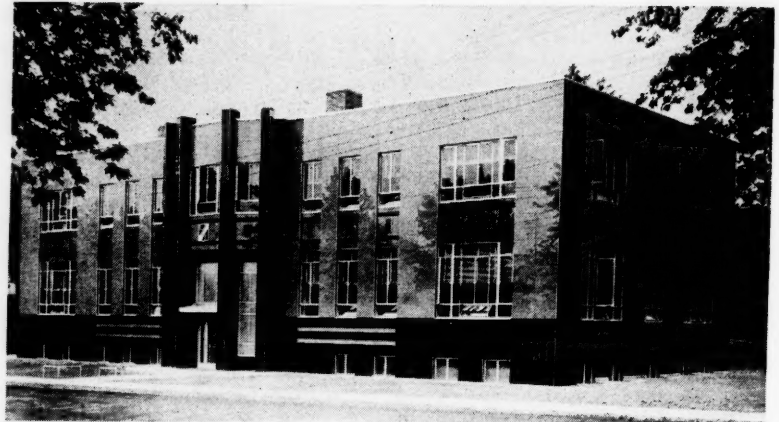
Let's check up on that criticism, and narrow it down to building materials. Let's go even further and tie it down to one material—glass.

Why glass? Well, because it is a truly southern product; because glass, despite that it is one of Man's oldest known materials, is as new as tomorrow's newspaper, and it is revolutionizing architectural thinking and building procedure everywhere.

The manufacture of glass was not only the first industrial enterprise on American soil—it was inaugurated on southern soil, on the banks of the James river in Virginia in 1608.

And a southerner, Michael J. Owens, son of a West Virginia coal miner, came elbowing his way out of the fuel-jammed mountains of the Panhandle state to win international fame and fortune by the invention of machines that did more in a few years to revolutionize the art of glass making throughout the world than anything else had done in the product's 5,000 years of history.

His perfection in 1916 of a practical



mechanical method for the automatic continuous flat-drawing of window glass completely changed all existing methods, and intensified research and development programs that have led to many forms of the modern flat glasses of today.

The machine was so successful that a factory was begun in Charleston, W. Va., and it quickly became and remains the world's largest window glass plant. From it go trainloads of window glass for factories, skyscrapers, shops and homes in cities, farm homes and cottages in whistle-stop communities of every state of the union.

(An adaptation of those window glass machines has made it possible to draw plate glass on a continuous line, too, so that Charleston also produces thin plate glass for the laminated safety glass used

in millions of motor cars throughout this country.)

A new office building recently erected at the Charleston plant has attracted national attention among manufacturers, builders and architects. It is made of glastone, a recently-introduced glass-faced masonry unit that enables buildings for the first time to be erected to any height with glass . . . and in permanent colors.

Glastone is a southern product, too, because its face is of Vitrolite structural opaque flat glass made in a wide variety of colors in a southern plant, at Parkersburg, W. Va.

The first use of this southern product, already stimulating architectural thinking to new construction and design throughout the country, was for a southern office building. And right now there is being erected with glastone one of the most modern of buildings in a southern state (North Carolina) that will, when opened, mark a new era in "glass buildings."

Vitrolite itself, which is manufactured in Parkersburg, is doing a remarkable architectural face-lifting job along Main Street everywhere, as more and more store owners come to realize the increased business accruing from "putting up a front." In factories, offices and public buildings, this product is making tremendous strides for facing corridors and rest rooms, even in old structures of traditional architecture.

In this latter respect, the South recently completed a job that has operators of weary old courthouses throughout the



Above—New office building of the Libbey-Owens-Ford Glass Company's window and plate glass plant at Charleston, West Virginia. This building is constructed entirely of Glastone, a new glass and concrete load-bearing structural material, in color. The building is in sun tan, green, Van Dyke brown, red and aluminum. Left—Dreary interiors in this 100-year old Fairfield County courthouse at Winnsboro, S. C. have been completely changed by the gray vitriolite on the corridor walls. Architect G. T. Harmon of Hartsville, S. C., who directed the modernization, specified approximately 2,400 square feet of the structural glass for wainscoting. Another Southern product, Blue Ridge Satinol Louvrex, was used extensively for interior doors and all glazed office partitions.

MANUFACTURERS RECORD FOR

North itching to inspect the recently modernized Fairfield County courthouse in Winnsboro, S. C., designed 100 years ago by Robert Mills, pupil of Thomas Jefferson. Architect G. Thomas Harmon of Hartsville, S. C., did a fine job with a southern product, Vitrolite.

In the western foothills of the Blue Ridge mountains, at Kingsport, Tenn., there is a glass plant that is helping manufacturers get far greater efficiency out of their operations than heretofore believed possible. This is due to the development of a heat-absorbing glass known as aklo. Because of its special chemical properties, this glass absorbs infra red rays which carry approximately 50 per cent of sun-ray heat. Combining this quality with patterns that diffuse light and reduce glare, such glass not only greatly assists in temperature control in buildings with or without air-conditioning equipment, but it provides a diffused light that is restful for the eyes of workers.

In the Buffalo plant of an airplane manufacturer, for example, great areas of Aklo glass not only reduce sun-ray heat, but diffuse the light so well that reflection from highly polished metal parts of planes is sharply reduced, thus benefiting the workmen immeasurably.

The vast majority of new plants and office buildings are air-conditioned, and existing structures are rapidly being air-conditioned, so that Blue Ridge aklo from Tennessee is playing an increasingly important role in saving temperature control costs, increasing employee productivity and comfort and thus enabling greater production at a better profit.

True it is, that these southern-made flat glass products have been applied rapidly in the North, much more so than in the South, but possibly this has been due to the fact that the Northern states have had greater opportunities for vast industrial activities based upon a larger volume. This would result, of course, in more intensified effort to utilize anything and everything that would make for more efficient, less costly and more profitable operations.

Naturally, then, one could take the position that the overwhelming trend to the use of glass throughout the North has been a natural one. On the other hand, the South, home of these materials, has not been slow to utilize its own products.

As soon as southern manufacturers have been able to check upon and analyze results obtained with glass by their Northern neighbors, many of those same men have quickly followed suit, and southern architects and builders thus have been able in many instances to proceed along construction lines that they themselves have been convinced about for a long time.

Let's make a quick check on that statement. Georgia is a typically south-

Top—One of the most striking uses of new types of glass is in the Henry Grady Hotel in Atlanta, Ga. Privacy from the street is coupled with unusual decorative effects by glazing a large wall area with Blue Ridge luminex wire glass. The patterns are obtained by sand blasting the glass. Center—Blue Ridge aklo glass is used in the large window areas of this Curtiss-Wright Corp. plant to reduce sunray heat and to cut down glare to improve working conditions. Bottom—Hammered aklo for all windows in the rear (west) elevation of the Coca-Cola bottling plant in Atlanta gives protection from sunray heat by absorption, provides efficient lighting for the rear of the plant by reduction of glare: Blue Ridge luminex wire glass is used in the skylight. Architect Geo. H. Bond.

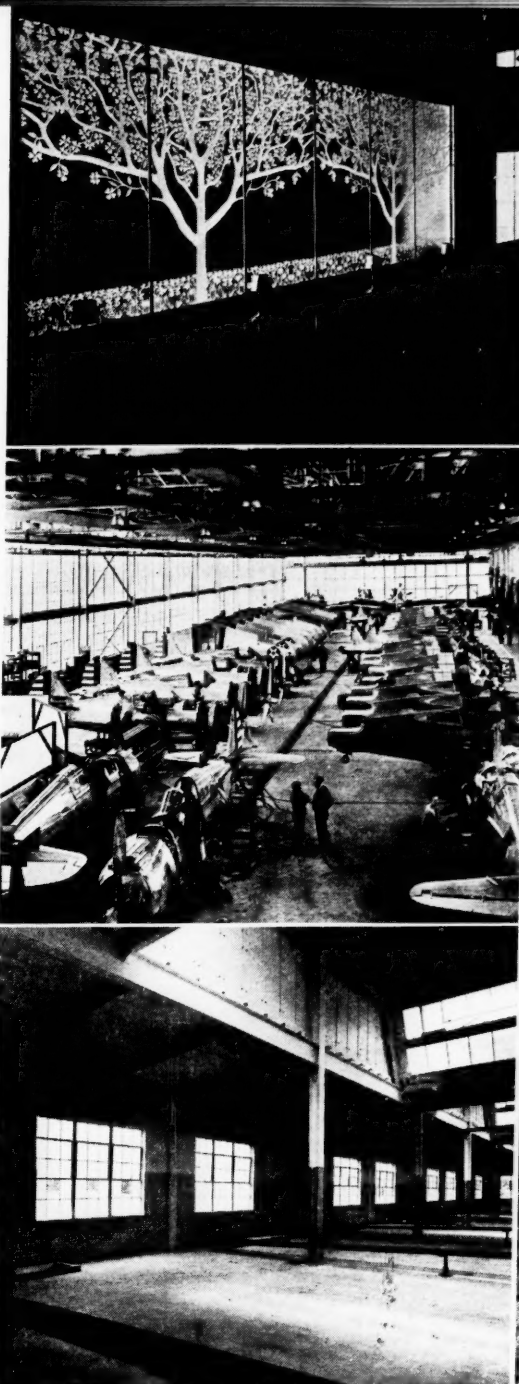
ern state and, in the minds of many not acquainted with the fine building progress there, is still regarded as somewhat in tune with "Gone With the Wind."

Those who feel that way about it, would quickly change their minds if they were to see, to cite a few examples, the Swift Manufacturing Company's textile mill in Columbus, Ga., where Aklo glass is utilized so successfully in a new plant; the Aklo wire glass in the skylight to control temperature and reduce glare for efficient, softly diffused lighting in the Citizens & Southern Bank Building in Augusta; the Willis Irvin-designed structure for Sears Roebuck & Co., Augusta, with its vitrolite and vitrolux front, and spectacular three-story signs in colorful vitrolux, a heat-tempered translucent plate glass that has created "luminous architecture;" the use of heat-absorbing Aklo in windows of a Coca-Cola bottling plant in Atlanta, designed by Architect George Harwell Bond; the Blue Ridge Tobex wire glass in the Hilliards Tobacco Warehouse, Douglas, Ga.; Aklo in the Superior Laundry plant, Atlanta; Blue Ridge satinol louver, a directional and decorative pattern glass that brings in but diffuses light efficiently for the Georgia Power Co., Atlanta (designed by Architect I. Moskowitz); the striking use of vitrolux and vitrolite in the Putzel Electric Co., Macon. And travelers from East, West and North daily are impressed by the use of vitrolite and vitrolux in the Greyhound Bus Terminal at Savannah, recognized as one of the smartest transportation terminals in this country.

One could go into Tennessee, Mississippi and other southern states and point out newly erected or remodeled structures that reflect the trend to southern-made new types of flat glass products. And, while we are in that neighborhood, it shouldn't be forgotten that some of the finest window glass ever made is produced in Shreveport, La., most southerly of all window glass plants. Sand for that glass is brought over from the White River district in northeastern Arkansas, some of the finest silica sand in the world, and by the heat supplied by the South's natural gas fields, that sand is

turned into millions of windows for millions of eyes.

In an industrial building sense, the South hasn't advanced so rapidly as northern states in applying southern-made glass products, but the South is polka dotted with some of this country's finest architectural and decorative applications of one of Man's oldest known materials. And indications are that, as soon as southern manufacturers generally are made aware of the advantages to be derived from their southland products, those polka dot examples will spread and merge into a solid pattern of glassical applications that will force the North to step fast . . . not to keep ahead, but to keep abreast.



THE SOUTH'S MATERIALS FOR THE COUNTRY'S DEFENSE

One of the most vital factors connected with industrial mobilization, whether it be in preparation for national defense or in the prosecution of war, is the conservation and production of raw materials. After surveying our national resources, the Army and Navy Munitions Board has concluded that necessary basic raw materials and some secondary products should be segregated into three classifications.

Strategic. Materials including antimony, chromium, coconut shell char, manganese, manila fiber, mercury, mica, nickel, quartz crystal, quinine, rubber, silk, tin and tungsten, are those essential to the national defense, the supply of which is dependent, in whole or in part, on resources outside the United States. Of these the South produces at least eight in varying quantity.

Critical. Materials which are essential in a lesser degree or are available in more adequate quantities in this country. These include aluminum (of which the South produces over 50 per cent), asbestos, cork, graphite, hides, iodine, kapok, opium, optical glass, phenol, platinum, tanning materials, toluol,

vanadium and wool. In this group, the South contributes not only many of the items but several of them in large quantities.

Essential. Materials ordinarily obtainable in this country in sufficient quantity for normal use but which might, under stimulated demand, become so depleted as to place them in the class of critical or strategic materials. Of these the South contributes a larger part than any other area as evidenced from the fact that the value of mineral production in 1937 totaled \$2,066,993,227 against \$2,633,662,191 for the rest of the country.

On this and the following pages are discussed the *essential* as well as some of the *strategic* and *critical* materials insofar as the South is concerned. In connection with these minerals the attention of readers is called to the extensive article by Dr. G. C. Branner on the South's mineral production published in the November, 1939 MANUFACTURERS RECORD, a few reprints of which are still available.

In future issues it is expected to publish further articles concerning the *strategic* and *critical* materials. *Editor.*

ALABAMA

ALABAMA'S commercial reserves of coal, iron and dolomitic limestone occupy an important position in the South's supply of *essential* materials. At the present time coal and iron are commercially produced in eleven counties while limestone is similarly produced in seven counties. Known reserves are sufficient for 150 years based on normal production, consequently these deposits together with others not now being worked, are fully capable of supplying an infinitely greater demand than at present.

Other important minerals of Alabama produced on a commercial scale include asphalt, bauxite and clays of different kinds. Dolomites which occur principally in Jefferson county offer possibilities in mining magnesia besides forming the

basis for a large chemical industry.

Pyrite (iron pyrites), occurs at Pyriton, Clay county, in a deposit that was mined throughout the last war but has since been idle.

In addition, Alabama contains not less than three of the *strategic* materials—mica, which already is being commercially produced in five different counties, and manganese and quartz. At Anniston there is a plant where low grade manganese ore, of which there is an abundant supply, is being chemically converted into high grade valuable ore. This is a thing that should be carefully watched as low grade manganese is very plentiful in the South.

Finally, among the primary *critical* materials, Alabama has large deposits of graphite which are uniform in content

and easily mined. Ordinarily, these deposits have not been worked to any appreciable extent because the grade of the ore is low and could not compete with foreign supplies. During the World War, more than 30 mills for grinding graphite were in operation throughout Clay, Coosa, and Chilton counties and it is likely that with curtailment of foreign supplies, there will be renewed demand for Alabama graphite, especially with recent improvements in milling technique and chemical treatment. Most of the world's graphite comes from Chosen, Germany (Bavaria and Austria), Ceylon, Madagascar and Mexico while Canada is the principal source of artificial graphite. In the past ten years United States production of graphite has been negligible.

ARKANSAS

THE *essential* minerals of Arkansas include a wide variety of products of which the principal ones are petroleum, natural gas, coal, natural gasoline, zinc, clays, lead, limestone and rutile. Reserves of certain of these minerals now commercially produced, are estimated as follows:

MINERAL	AMOUNT
Petroleum (barrels)	326,270,000
Natural gas (cu. ft.)	996,000,000,000
Coal (short tons)	1,513,162,000

Among *strategic* materials, Arkansas has deposits of antimony, manganese,

mercury (or quicksilver), and quartz crystals all of which are being commercially produced in one or more counties.

In the classification of *critical* materials is aluminum and in this connection it should be noted that Arkansas' two counties, Hot Spring and Saline, produce approximately 95 per cent of this country's bauxite with an estimated reserve supply of 25,000,000 long tons.

Other important minerals of Arkansas include titanium oxide, which occurs commercially at but a few points in the United States, and bedded barite, the

quarrying of which in the Ouachita Mountains has recently provided a new industry for the state.

Reserves of non-metallic minerals are, for the most part, practically unlimited, and include deposits of chalk and marl in the southwest, limestone, dolomite and glass sand in the north, and clay and shale deposits which are widely distributed.

Supplementing the minerals mentioned, asphalt, fuller's earth, gypsum, phosphate rock, iron and silver are known to be present in the state.

FLORIDA

BY

*Herman Gunter and Sidney A. Stubbs
Florida Geological Survey*

THE present war conditions will probably again direct attention to certain mineral deposits of Florida which have not been worked in recent years and to others that may be worked on an increased scale.

The deposits of ilmenite, rutile and zircon in the beach sands along certain portions of the east coast of the State has accounted for a portion of the domestic production of these minerals. They occur as concentrates in the beach sand and during the World War these deposits were utilized. Ilmenite and rutile, oxides of titanium, are used in the production of titanium tetrachloride which was used in tracer bullets, spotting shells and gas offense. The zircon was used in the manufacture of certain types of high grade porcelains and in refractories. Continued hostilities will undoubtedly revive an interest in the development of these mineral deposits in Florida.

Extensive deposits of hardpan, a dark-colored, semi-cemented sand, occur in

Florida. This material has been mined and used in the manufacture of an organic dye and it is possible that such developments can be profitably resumed.

The diatomite deposits of Florida are extensive and the recovered product is of exceptional purity. The deposits are of fresh water origin, occurring intimately mixed with organic matter or peat. When the peat is removed through calcining, the resultant diatomite is of a grade that is essential to the chemical industry and grades lower in quality can be used for other purposes. It is believed that Florida has large reserves that are as yet untouched.

During recent years extensive dolomite deposits have been prospected in the western part of the Peninsula. At the present time these have been developed at only three points. During the past

war there was a large demand for dolomite and a similar demand can be anticipated should European hostilities continue for an indefinite time. Florida's strategic location as to transportation facilities should make her dolomite deposits increasingly desirable.

Various earth pigments, particularly ochres and iron oxide pigments, are found in Florida. These deposits have as yet not been sufficiently prospected but it is believed that the potential reserve of these minerals is sufficient to be commercially developed.

Florida's fuller earth deposits have for years furnished a large percentage of the world supply. The fullers earth is of a type particularly adapted to the petroleum industry and any increased demand for petroleum products will necessarily increase the demand for Florida fullers earth. Deposits of bentonitic clays are also known in Florida and these may likewise come in for development with a stimulation for filtering clays.

GEORGIA

BY

Garland Peyton and A. S. Furcron**

IN the event of a general World War many new developments will take place in Georgia's mineral production. This is due particularly to the fact that Georgia contains a great variety of minerals, many of which are necessary in modern warfare.

Some of these minerals are used directly in warfare. Such important minerals as asbestos, barite, bauxite, chromite, coal, copper, feldspar, graphite, iron ores, kyanite, manganese, mica, ocher, potash-bearing slates and talc may be mined. Manganese and chromite as well as the iron ores, mica and pyrite may be regarded as essential to warfare.

Manganese is essential in the manufacture of armor plate for battle ships and hard steel used in warfare. It is used to make dry cell batteries and has wide uses in the chemical field, such as in the production of chlorine and oxygen. Georgia is the foremost State in manganese reserves. At present, manganese is mined in the famous Cartersville district where large ore reserves are available. Important deposits occur in the vicinity of Cave Springs. Other manganese producing localities in the State are the Drake-town, Tunnel Hill, Varnell-Cohutta, and Doogan Mountain districts. There are, also, many occurrences in the Piedmont area of the State. In many cases, our manganese deposits have not been adequately prospected. A study of only 17 of these deposits in 1918 by the U. S. Geological Survey places Georgia well up at the top in reserves among the few States

that possess manganese. When the last World War broke out production of manganese in Georgia jumped from around 4,000 tons in 1915 to nearly 18,000 tons in 1918.

Chromite is another mineral necessary in modern warfare. Chromium, which is extracted from this ore, is extensively used in plating steel and to make hard steel. At present nearly all of our chromite is imported, yet Georgia contains deposits of chromite which have not been satisfactorily prospected. Deposits are known to occur in Towns, Rabun, Union and Troup counties.

Sulphuric acid necessary to manufacture of explosives may be obtained from the extensive pyrite deposits of the State. These deposits were worked on a large scale during the last war. They will probably be opened again even though war should not occur. Some of these veins have a known thickness of 40 feet or more.

The iron ore deposits of the Cartersville area and of northwest Georgia have been worked for years. In northwest Georgia they lie near coal deposits. The coal has been extensively coked in the past at Chickamauga. The iron ore deposits of northwest Georgia are also within easy shipping distance of Birmingham. It has been estimated that in the case of one type of ore alone (bedded hematite) the aggregate length of beds

more than two feet thick is approximately 175 miles.

Mica deposits are worked near Clarksville, Georgia, and have been mined or prospected in many places throughout the crystalline area of the State. During the last war mica was extensively mined in Upson, Monroe, Cherokee, Pickens, and other counties in Georgia. Sheet mica is used for electrical insulation purposes and thus finds use in all types of electric appliances.

Aluminum, essential to the manufacture of airplanes, shell casings, etc., is extracted from bauxite. This mineral was first discovered in America near Rome, Georgia. It has been extensively worked in north and south Georgia. A recent study by a member of the staff of the Division of Mines shows that at least a million and a quarter tons of blocked out bauxite exists in the State and that possibly reserves may equal seven million tons.

Georgia expects to supply her share of manganese and other strategic minerals to be produced by the War Industries Board in accordance with the authorization and appropriation passed by the last Congress. Also Georgia expects to have the U. S. Geological Survey and the U. S. Bureau of Mines conduct some prospecting and development work on the mineral deposits of Georgia with a portion of the funds provided for that purpose.

*Director and Geologist respectively of the Georgia Division of Mines, Mining and Geology.

KENTUCKY

ALTHOUGH Kentucky does not produce commercially any of the *strategic* or *critical* materials, it is nevertheless one of the most important of the Southern States mineralogically, ranking fifth in production value and contains enormous quantities of *essential* materials. By far, the largest part of the mineral production comprises coal which totaled almost 40,000,000 tons in 1938 and, upon demand, this tonnage can, with reasonable ease, be increased to at least 50,000,000 tons from the mines now operating besides others which can be put into use when the demand occurs.

Kentucky coal is of two kinds—bituminous and cannel—and is found mainly in two fields located at opposite ends of the state. Though bituminous is the most prolific, cannel is found in both fields and particularly strong beds are located in several of the eastern counties. While the varieties of coal differ in areas, possibly the greatest differential is that of sulphur content. In the eastern field all the coals are low in sulphur, seldom over three per cent, and the majority of commercial seams are less than one per cent. On the other hand, Dr. G. W. Burroughs, former Assistant State Geologist of Kentucky, states that the lowest county average of sulphur content in the western field is

3.22 per cent. Coals of the western field, which cover nearly 5,000 square miles, have an average heat value of 12,000 B. T. U., while those of the eastern field, covering an area of over 10,000 square miles, have a heat value frequently approximating 14,000 to 15,000 B. T. U.

The oil industry of the state, while important, is not as important as coal. There are several thousand producing wells averaging about 1½ barrels per day, or a total of between 14,000 and 15,000 barrels per day. Most of these wells are of the pumping or stripper class. Upon demand, many of these old fields can produce added oil as a result of either flooding or the introduction of air or gas to restore the original pressures. Natural gas production in Kentucky, which at present approximates 40,000,000 cubic feet per year, could be increased to 50,000,000, cubic feet or more without any difficulty.

Coke, which is produced commercially on a large scale in only one county and is of the by-product variety, is available for production in numerous places from suitable coals.

Fluorspar deposits, which are the second largest in the United States, are confined to a comparatively few counties. Nevertheless, additional veins are known

from those now being worked, and since these are a source of lead and zinc ores, their importance is obvious.

Barite, sphalerite, and galena are usually accessory minerals associated with the fluorspar veins in both Eastern and Western Kentucky, and the output of any of these would not be very great. However, these minerals are separated in preparation of the spar, and would be given more attention in case of emergency.

Large areas of iron ore are known to exist in the state, but their low grade has not yet occasioned any noticeable demand for commercial production.

A similar situation exists regarding the state's oil shale reserves, which have been conservatively estimated at 100 billion tons, and a content of one-half barrel per ton. These, and the inexhaustible quantities of impure limestones, offer unusual opportunities for the production of rock wool and other insulating products.

Great as is the production of minerals in Kentucky, nevertheless it is estimated that the average percentage of deposits of 24 minerals that are actively worked is less than 15 per cent. Coal and petroleum, each averaging 75 per cent, are not included.

LOUISIANA

LOUISIANA'S absence of *strategic* and *critical* materials is more than balanced by the enormous output and reserve supplies of *essential* minerals.

In 1939, 91,903,000 barrels of crude petroleum were produced while the quantity of natural gas totaled almost 336 billion cubic feet. In the same year, natural gas was the basis from which over 68,000,000 pounds of carbon black were manufactured. The remaining two minerals of outstanding importance are salt and sulphur, production of which was 607,194 tons and 364,850 tons respectively. Forty-five parishes produce oil or gas or both, the 19 remaining as yet unproductive

parishes are all potential producers, many having had good shows which make them attractive areas for the future. Indications of Louisiana's mineral importance are seen in the fact that a considerable number of the fields are centered in salt domes with oil, salt, sulphur, and limestone all being present.

Rubber, which is classified as a *strategic* material is not a commercial product of this country but synthetic production is being accorded greater interest than heretofore so that the Buna rubber plant now being erected in Louisiana by the Standard Oil Company may well be followed by others since petroleum and

natural gas or their products form the basis of this new industry.

Petroleum and natural gas also are the bases of many chemical industries, the former offering large possibilities for the manufacture of alcohols, aldehydes, acids, resins, naphthenates, solvents, chlorinated and sulphurized products, wax products, plastics, and oxidized petroleum products. Hydrogen, carbon tetrachloride, chloroform, aldehydes, alcohols, acids, and ethers offer additional products from natural gas. Sulphur products include sulphides, polysulphides, sulphates, sulphur chlorides, carbon disulphide, sulphur cements, sulphur resins, and plastics.

MARYLAND

MARYLAND'S principal mineral in the *essential* class is coal, being produced in Garrett and Allegany counties where the 1937 output exceeding a million and a half tons could be materially increased with comparative ease and little or no additional plant expansion. Other *essential* minerals include coke, clay, limestone and quartz each of which are produced in one or more counties.

Among other Maryland minerals are asbestos, chromium, copper, iron ores, mica and manganese. Asbestos materials

are found in several parts of the state and until recently this commodity was being commercially produced so that in time of need its revival could probably be brought about with comparative ease. Chromium or chromite exists in Baltimore and Harford counties and its presence in Carroll, Cecil and Montgomery counties was responsible for the establishment of this industry in Baltimore: during the past war a very small quantity was produced and it is doubtful if much more could now be obtained even under government

subsidy. In case of emergency however, a carload of chromite might be of definite value providing like amounts could be obtained from a sufficient number of other sources. The situation regarding manganese and copper is similar to that of chromite. Brown iron ore was at one time mined and refined in Allegany, Baltimore, Carroll, Caroline, Frederick, Harford, Washington and Worcester counties. Mica is found throughout the state but in normal times it has not been found economically productive.

MISSISSIPPI

DISCOVERY of oil in Mississippi during 1939 together with the production of natural gas which has become available since 1930, places this state among others of the South with valuable *essential* minerals.

In addition to the clays now produced there are enormous deposits of different varieties and excellent quality in several parts of the state.

Other minerals with known deposits of a size and quality fully adequate for com-

mercial production are limestone, marls, tripoli, lignite, gankite, salt and bauxite. Still other minerals believed to exist in commercial quantities but waiting further exploration include Fuller's earth, novaculite, silica, asphalt and gypsum.

MISSOURI

MISSOURI'S principal contribution to the South's supply of necessary materials will probably be confined to the *essential* group. In this classification will belong barite, coal, clays, copper, iron ore, lead, natural gas, petroleum, tripoli, zinc, zinc and lead pigments, and a few other minerals produced in smaller quantities with lead, zinc and coal respectively the most important in point of total value. As recently as 1936 Missouri ranked first among the states in the nation's production of lead, barite, chats and tripoli and second in the quantity of raw clay produced.

Rock wool is likely to become an im-

portant Missouri industry as a result of surveys in St. Louis, Boone and Pike counties where Sedalia limestone with the proper chemical composition has been found in a central formation with outcroppings adjacent to the railroads. One plant already has been established in Boone county.

Among *strategic* materials, Missouri has deposits of at least two. From the mines of the Silver Mine area of Madison county is now procured in small commercial quantities, tungsten ore concentrates of 60 per cent WO_3 . The other *strategic* mineral is nickel which, together with cobalt, copper and silver, is produced main-

ly by extraction in the course of smelting concentrates of other minerals. Nickel, cobalt and copper also occur in small percentages in large tonnages of complex ore in Madison county. Additional deposits of copper in Shannon and St. Genevieve counties are known to exist and may be used if demand warrants.

The occurrence of strontium bearing minerals is now being explored while pyrites including marcasite, has been produced in three districts of Missouri and promises a continued supply for the production of sulphuric acid and other materials.

NORTH CAROLINA

BY

H. J. Bryson, State Geologist

THE minerals of North Carolina may be divided into two great groups, the metallic and nonmetallic. The metallic minerals are those minerals which are used principally for their metal content, while the nonmetallic are those used other than for the metal contained.

Metallic Minerals:

The principal metallic minerals found in North Carolina are copper, lead-zinc, iron, manganese. There are also, however, known deposits of low-grade nickel ore, chrome ore, and tin.

The principal copper deposits are confined to Swain, Graham, Jackson, Haywood, and Ashe counties. At the present time only one mine is in production. However, there are valuable commercial deposits now being prospected in Jackson and Ashe counties. The best known mines are the Fontana, Cullowhee, Savannah, Elk Knob, and Ore Knob.

The principal lead and zinc deposits occur in the Silver Valley and the Silver Hill sections of Davidson County, in Montgomery County north of Troy, in Haywood County near Waynesville, and in McDowell County near Woodlawn. During the past several months some prospecting and development work has been conducted in these sections. It is believed that all of these properties have ore of commercial value, as the results of the prospecting so far have shown rather large bodies of ore.

The iron deposits of this State are found principally in the Piedmont and Mountain sections. The principal magnetite deposits occur in Guilford, Madi-

son, Watauga, and Ashe counties. At many places in these counties iron ore has been produced in the past, but no mines are in production at this time. The ores contain from 30 to 70 per cent metallic iron. However, most of these deposits contain small percentages of titanium. The tonnage of these deposits, according to estimates, is rather large.

The limonite iron ore occurs principally in Cherokee County along Valley River. During the World War a number of mines were operated in this area. The tonnage appears to be quite large.

Manganese deposits are known to occur in Stokes, Gaston, and McDowell counties. One deposit in McDowell County, now being prospected, shows ore running as high as 58% manganese. No manganese has been produced in North Carolina during the past several years.

The nickel deposits of the State occur principally in Jackson County. However, known deposits also occur in Clay, Haywood, and Buncombe counties. The ore is usually in the form of a silicate and is associated with the peridotite deposits. The nickel content varies from a trace up to 7% or more. Some development work has been done recently in Jackson County near Webster, and it is reported that plans are underway for the construction of a small furnace. Considerable research has been done by this Department during the past few years in trying to work out a satisfactory concentration method, to

produce a high-grade nickel concentrate. Satisfactory results have been obtained on some of the ore.

The principal chromite deposits in North Carolina occur in Jackson, Yancey, and Buncombe counties. During the World War deposits from these counties produced some high-grade concentrates. The ore occurs as small veins varying in width up to two or three feet. In some localities, however, "granular" chrome ore occurs, which is known locally as "sand chrome."

In the Piedmont section, beginning at Kings Mountain and continuing into the northern part of South Carolina, there occurs a series of pegmatite dikes, in which tin has been found. During the past few years considerable prospecting has been done on the tin deposits in the vicinity of Lincolnton. A company has recently been organized to further develop these deposits. The tin occurs in a very small percentage, but such other minerals as spodumene, mica, and kaolin, may be worked as the principal minerals and tin recovered as a by-product.

Nonmetallic Minerals:

The principal nonmetallic minerals now produced in North Carolina are pyrophyllite, talc, kyanite, spodumene, olivine, kaolin, feldspar, mica, and vermiculite. Only one of these minerals will be classed as a *strategic* mineral, but many of the others become more valuable during war times.

Pyrophyllite is not a *strategic* mineral, but it is used in the manufacture of battery boxes, and therefore becomes very

valuable during war times. The principal deposits of pyrophyllite occur in Moore and Randolph counties. The three companies are now producing this mineral in rather large quantity, and each of the companies has several million tons in reserve for further production. The talc deposits of the State are confined largely to Cherokee and Madison counties. The principal mines in Cherokee County will be flooded, however, with the Hiwassee Dam of the TVA. At the present time five talc deposits are being prospected and plans are underway for the construction of a grinding plant. The talc in this belt is considered the finest talc produced in the United States.

Kyanite deposits are distributed through many of the western counties with the principal production at present near Burnsville in Yancey County. Other large deposits occur in Yancey, Mitchell, Buncombe, and Macon counties. Kyanite occurs usually as disseminated crystals in a schist, and a process of separation is required to produce a high-grade material.

The spodumene deposits of North Carolina are confined largely to the Kings Mountain Area in the Piedmont section. Estimates by competent geologists and

engineers reveal deposits containing millions of tons of spodumene. Spodumene is of interest as a source of lithium, a metal which will float on water and which is used in hardening aluminum and lead. Spodumene also is used in the manufacture of ceramic materials. It is also the principal source of lithium, which is used in the manufacture of lithium chloride for air-conditioning equipment.

The mineral olivine occurs in large quantity in many of the western counties, but the principal production so far has been from Jackson and Mitchell counties. The olivine is finding wide use in lining open-hearth furnaces and in the manufacture of refractory brick, which have proven quite valuable in copper smelters.

North Carolina has long been one of the leading residual kaolin producers, and during the past five years deposits containing millions of tons of recoverable clay have been investigated and developed. This clay will become more valuable as imports from England are curtailed. The North Carolina clay is quite similar to, and in some respects better than, the English clays.

North Carolina is also one of the leading producers of feldspar. This mineral has wide use in the manufacture of

ceramic products, especially chinaware and glass. The principal production to date has been in the Spruce Pine district of Yancey, Mitchell, and Avery counties. In 1937 the total value of production exceeded one million dollars, but in 1938 the production was considerably less on account of the competition of nepheline-syenite from Canada.

North Carolina is one of the leading mica producing states in America, and is now producing more than fifty per cent of that produced in the United States. Since mica is one of the strategic minerals it becomes of considerable value during war times. To date there are no substitutes for mica, and therefore it is absolutely necessary during war times. The State of North Carolina has hundreds of old mines which contain considerable reserve supplies of sheet, punch, and scrap mica. It is possible that the State alone could, at a price, supply all of the mica necessary in times of war. The production, however, is usually small on account of competition from imported material. Since mica is such a valuable mineral during war times, plans are underway for a survey to collect information on the location, quantity of mica produced in the past, and the possible future reserves in North Carolina.

OKLAHOMA

OKLAHOMA'S principal minerals are of the *essential* class and include petroleum, natural gas, natural gasoline, zinc, coal and lead, the annual production value of which exceeds \$360,000,000. Ample supplies of these items exist in the state and production to meet demands can be made, it is believed, with comparative ease.

In addition, the following materials are known but are not yet being commercially utilized:

Magnetite and hematite in Comanche and Keowa counties. Some low grade hematite ores have been mined and though the extent of both these iron ores is not fully known, recent studies indicate magnetite at least to be more extensive than formerly believed.

Wool rock is available in several sections of the state as a result of recent research by the Oklahoma Geological Survey.

Grahamite formerly was mined in Atoka and Pushmataha counties, and considerable quantities of the material are known in these and adjacent counties.

Dolomite deposits of Oklahoma have not been extensively utilized for the technical and special uses of the mineral although large deposits of high grade are present in the Arbuckle Mountain area in Johnston and Murray Counties and beds of dolomitic rock are present in several western counties.

Manganese has been known in the Arbuckle Mountains for many years and during the last World War, several cars of ore were shipped from the vicinity of Bromide, Johnston county. Manganese also has been reported from the Ouachita Mountains of southeastern Oklahoma.

Coke for domestic use was made extensively in Oklahoma before the advent of natural gas as domestic fuel but it is not now being made. The manufacture of metallurgical coke, to supply the foundries located in the Southwest, and the utilization of by-products, offer important possibilities that should be thoroughly investigated.

In addition to dolomite, there are possibilities of fire clays in association with coal beds, and considerable quantity of

novaculite and other silica materials which offer possibilities as refractories.

Brines: Oil field brines are going to waste in the large oil producing areas of Oklahoma, and brines from deep wells can be obtained in most all parts of the state. Some use has been made of these brines in the manufacture of chemicals, and during 1934-1935, Oklahoma ranked second in the nation's production of magnesium salts and calcium-magnesium chloride, made from brine. Sulphuric acid is now being manufactured at Bartlesville, Washington county, which, with an abundance of limestone and brines, offers possibilities for a chemical industry.

Barite is found in various forms in Oklahoma; as sandbarite crystals in central Oklahoma, barite nodules in southwestern Oklahoma, and a deposit of barite ore is reported from the Arbuckle Mountains.

Zircon crystals are found in a small area in the Wichita Mountains, and with the increasing demand and value of zircon for metallurgical purposes a closer search for commercial quantities of the mineral may be justified.

SOUTH CAROLINA

THE Minerals of South Carolina are essentially non-metallic and consist for the most part, of clay, kaolin, limestone, granite and barite all of which exist

in sufficient quantity to supply any reasonable demand. In addition, there has recently started commercial production of vermiculite and mica, the latter being one

of the *strategic* materials.

During the World War the old Haile Gold mine, which had been closed down for several years, was reopened in order

to work a large quantity of pyrite which had been left in the mine as it carried too little gold to pay for its extraction. In recent years this mine has been reopened and worked for its gold content. From this source, and possibly some other

mines in the state, could be obtained a supply of pyrite either through direct production or as a by-product.

Manganese, also a *strategic* material, was mined during the last war from a deposit at McCormick and the product

shipped to Birmingham, Ala., for use by the steel companies. As the deposit is small and of low content it has not been able to compete with other sources since the war, but it may now again offer possibilities.

TENNESSEE

AMONG the various minerals available in Tennessee and classified as *critical*, *strategic* and *essential* are copper, zinc, petroleum, iron ores, aluminum, pyrite, phosphate, flint linings, and ball clays. Allied to these are certain chemicals such as sulphuric acid produced from pyrite, and phosphorus from phosphate.

It is possible that other chemical industries might also be attracted to Tennessee because of the proximity of acid to limestone and dolomite. Briefly reviewing these minerals, there is first of all the aluminum plant at Alcoa where, in 1938, was produced one-third of all new aluminum produced in the United States. The copper industry is the nearest to the Atlantic seaboard and, in addition, produces from its pyrite about \$2,500,000 worth of sulphuric acid annually. Tennessee is the second largest phosphate pro-

ducing state in the nation and, within the last two years, has advanced to a prominent position in the production of elemental phosphorus due to the new electrothermal plants in Maury county. The present zinc industry annually produces a large tonnage of ore and, upon demand, could greatly amplify this output.

The high grade clays of West Tennessee are particularly valuable, especially for bonding purposes, and would be greatly needed in wartime in the manufacture of clay pots for optical glass production. The tile plants at Daisy in East Tennessee are the chief source of acid tower rings, used in sulphuric acid cooling, and wartime needs greatly stimulate their production.

Of the currently less developed minerals, manganese is, doubtless, one of the first that would show definite increased

production in the event of emergency. It is estimated that East Tennessee has about 65,000 tons of high-grade manganese ores and these constitute one of the important reserves of the country. Several types of iron ores are distributed throughout the state, hematite or red iron ore having been the basis of a substantial iron working industry in East Tennessee up to some ten years ago. Good reserves of this type ore are still available, and brown iron ore reserves in the West Highland Rim area are estimated at about 14,000,000 tons. During the last war some revival of iron manufacture occurred in the state, and this should again take place in any future eventuality. Flint linings were shipped from Tennessee during the last war as a substitute for imported Belgium flints, these flints going into the linings of pebble mills.

TEXAS

BY

Drs. E. H. Sellards, Director, and Virgil E. Barnes, Geologist, Bureau of Economic Geology, University of Texas.

TEXAS is the largest state of the United States and has 254 counties within its boundaries. This limits the detail in which mineral statistics can be given in a short resume, and for many minerals such as petroleum and natural gas the counties in which these are produced will not be enumerated.

Texas is fortunate in having an abundance of power producing minerals and should take advantage of this fact to produce more of the other mineral wealth of the State especially of the non-metallic minerals many of which are in abundance. In addition to the power producing minerals, dams have been erected to produce electricity at a very reasonable cost. The series of dams on Colorado River is very favorably situated to furnish power for the development of the varied mineral resources of the Central Mineral region of Texas. This region contains a large number of mineral resources, among which is an abundance of building and industrial stones. This area also contains asbestos, barite, feldspar, graphite, greensand, gypsum, magnesite, mica, talc, and vermiculite of the non-metals and bismuth, chromite, lead, manganese, molybdenum, the rare-earth minerals, and tin of the metals.

The mineral production of Texas during 1937 exceeded in value the production of the nearest state by 35 per cent. This compares very favorably with an excess of 8 per cent during 1936 and 5 per cent

during 1935. Of the total minerals produced in the United States during 1937, Texas produced 15 per cent valued at \$813,270,605. According to statistics collected by the United States Bureau of Mines in cooperation with the Bureau of Economic Geology of the University, Texas mineral production for 1938 is valued at \$740,141,000.

The mineral production of Texas is preponderantly non-metallic, less than 0.2 per cent of the production being metallic. Of the non-metallics, the hydrocarbons account for 92.4 per cent of the total production. Sulphur is next, accounting for 4.5 per cent, followed by cement accounting for 1.4 per cent of the total production.

In this paper the various mineral resources of Texas will be discussed in alphabetical order under the headings non-metals and metals. Several that are mentioned have been either produced sporadically or are known to exist but have not been produced. Not all minerals occurring in Texas can be discussed in a brief paper.

Non-Metals

Abrasive materials—Texas is well supplied with the more common abrasive materials.

Diatomaceous earth occurs in the Blanco middle Pliocene formation of Crosby County, Texas, in two localities about 22 miles apart. In each locality there are two beds. In one the beds are 8 and 4 feet thick and in the other 4 and 3 feet thick. Diatomite has many uses other than as an abrasive.

Grinding pebbles composed of flint are abundant in an area coastward from the Balcones fault zone extending from Williamson County to Val Verde County. These flints are derived from the Edwards limestone to the northwest of the Balcones fault. Transportation by streams has rounded the pebbles and eliminated those that are weak. The pebbles are more numerous in old river terraces on divides than in lower terraces along rivers.

Novaculite is present in the Marathon basin of northern Brewster County, and it comprises "the Caballos novaculite" which is several square miles in extent.

Pumicite is widely distributed in Texas. Great quantities are found in all the counties which lie south of the Texas and Pacific Railway line in Trans-Pecos, Texas. Deposits are known in Kent, Wilbarger, Dickens, and Baylor counties and in the Staked Plains and High Plains to the west. It is also present in abundance in three of the Gulf Coast formations, namely, the Fayette, Jackson, and Catahoula formations. Many of these deposits are situated near railroads and centers

of population and could very well be utilized for scouring soaps and powders.

Tripoli is present in Lampasas, Burnet, Blanco, and San Saba counties of central Texas and is composed chiefly of sponge spicules which have been concentrated by the removal of lime from the Marble Falls limestone. A small amount of this material has been produced near Lampasas for use in drilling mud.

Asbestos—Tremolite and anthophyllite asbestos are present in Llano, Gillespie, and Blanco counties. This material has not been sufficiently prospected to determine the quantity present. The most promising area appears to be east of Enchanted Rock in Llano County.

Asphalt rock—Two localities have been utilized for asphalt rock in Texas. An asphaltic sandstone near Saint Jo in Montague and Cooke counties has been worked to a limited extent. The asphaltic limestone of the Anacacho formation has been extensively quarried in Uvalde County. The beds exploited range from 10 to 50 feet thick and contain 9 to 12 per cent asphalt. Other occurrences of asphaltic rock are known in Burnet, Coke, Pecos, Stephens, Anderson, Nacogdoches, and Jasper counties.

Barite—Barite is present in Llano, Gillespie, Val Verde, Jeff Davis, and Brewster counties. That in Val Verde County is present as fillings in caverns of the Edwards limestone. The Llano and Gillespie county barite is associated with pre-Cambrian schists and in general contains other minerals, thus necessitating beneficiation.

Carbon black—Forty plants produced carbon black in Texas during 1938. These plants are located in Carson, Gray, Hutchinson, Moore, and Wheeler counties, of the Panhandle, and Eastland, Stephens, Ward, and Winkler counties in the rest of the State. About 92 per cent of the carbon black is produced in the Panhandle.

Celestite—This mineral which can to some extent be used in making heavy drilling muds is present in Nolan, Brown, Lampasas, Burnet, Williamson, Travis, and Somervell counties. According to an unconfirmed report a few carloads of celestite were produced in Nolan County during 1939.

Cement—Ten plants produced nearly 7 million barrels of Portland cement in Texas during 1938. Most of these plants use Cretaceous limestones and shales or marls. Two plants at Houston used oyster shells from the Gulf Coast instead of limestone. In many of the Cretaceous and Pennsylvanian outcrop areas of the State materials are present from which cement can be manufactured.

Clays—China clays are present in Jeff Davis and Real counties. The former is associated with igneous rocks of the Davis Mountains in an area of rocks much altered hydrothermally. The latter is in sinks in the Edwards limestone and its

origin has not been adequately explained.

The Wilcox Eocene formation of the Gulf Coastal Plain probably contains more valuable clays than any other formation of Texas. These clays are utilized for the manufacture of brick, hollow tile, sewer pipe, and pottery. The main centers of clay-working industries utilizing these clays are in Bexar, Wilson, Medina, Bastrop, and Henderson counties. Similar clays are present in the Pennsylvanian formations of north-central Texas. The chief areas in which these clays are utilized are Palo Pinto, Erath, and Parker counties. Usable clay is widely distributed in Texas in rocks of Paleozoic, Mesozoic, and Cenozoic ages.

Fuller's earth and bentonite will be discussed together. The chief production is from the Fayette, Jackson, and Cathoula formations of Cenozoic age. Some is produced in Bexar County from the Taylor formation of Mesozoic age. Most of the Texas production has come from Walker, Grimes, Burleson, Fayette, Washington, Gonzales, Karnes, and Live Oak counties but deposits are known in other Gulf Coastal Plain counties. Bentonite is present in the southern part of Green Valley, Brewster County.

Coal—The United States Geological Survey estimated the total workable area of bituminous coal in Texas to be 8200 square miles with a possible additional area of 5300 square miles. It is estimated that 8 billion tons are present. This coal is in north-central Texas. The total workable area of lignite in Texas was estimated at 50,000 square miles with a possible additional area of 10,000 square miles. The amount of lignite present is estimated at 30 billion tons. Some Upper Cretaceous coal has been mined near Eagle Pass.

Feldspar—The pre-Cambrian rocks of Llano, Mason, Burnet, Gillespie, and Blanco counties of central Texas contain numerous pegmatites, some of which are large and composed essentially of feldspar. Two firms are contemplating the production of feldspar in Llano County at present. Feldspar is also present in the Mica Mine district south of Van Horn.

Fluorspar—Fluorspar has been reported from Hudspeth and Presidio counties of Trans-Pecos Texas and from counties of the Central Mineral region. A deposit recently examined in granite in Mason County appears to be limited in quantity.

Gem stones—Topaz of light blue color is present in the Streeter area of Mason County. Colorless topaz has been reported from other localities in Mason County and in Gillespie County.

The different ornamental forms of quartz—agate, amethyst, carnelian, chalcedony, jasper, and opal—occur in the volcanic rocks of Trans-Pecos County. Caringorm and amethyst are present in the Central Mineral region. Some tur-

quoise has been mined 6 miles west of Van Horn.

Graphites—The Central Mineral region of Texas contains abundant graphite schist bands. Graphite has been produced in Llano and Burnet counties from these schists. The graphite content of the higher grade schists may be as high as 15 per cent.

Greensand—Upper Cambrian and Eocene strata contain greensands. These greensands are probably too low in potash to be used commercially as fertilizers but have been used successfully as water softeners. A suggested use for the Cambrian greensand is for surfacing tennis courts.

Gypsum—This mineral is abundant in Texas in rocks of Permian and Cretaceous age. Five mines produced gypsum during 1938. Gypsum has been produced from Hardeman, Brooks, Fisher, Nolan, and Gillespie counties. The Gillespie County occurrence, which is in Edwards limestone, has not been widely known. Recently, 35 feet of gypsum has been uncovered in a shallow stripping operation and at least several square miles of gypsum are present in this area.

Helium—This rare gas is produced from the Cliffside gas field in Potter County. Up to June 30, 1938, 5,653,153,000 cubic feet of gas was produced from which 84,260,165 cubic feet of helium was obtained. This is the most important known helium reserve in the world.

Lime—Seven lime producing plants operated in Texas during 1938. These plants are in El Paso, Travis, Williamson, and Coryell counties. Limestone suitable for making lime is present in many localities of the State in the Cretaceous and Paleozoic rocks.

Magnesium—This mineral has not been produced as yet in Texas but may be produced for the first time in 1940. The known deposits are in Llano and Mason counties. This mineral was first brought to the attention of the public in 1938 by the Bureau of Economics Geology, Engineering Research, and Industrial Chemistry of The University of Texas.

Mica—Sheet mica of electrical grade may be present in the Mica Mine locality south of Van Horn. The sheet mica of the Central Mineral region of Texas has a false cleavage which prevents the mica from cleaving in uniform sheets. In this region, however, many outcrops of highly micaceous schists are present from which the mica can be separated and ground. A plant in Llano is now producing ground mica for roofing.

Mineral wool—Statistics on the number of plants and amount of rock wool produced in Texas are not available. Raw materials for producing rock wool are present in practically all portions of the State especially in those portions near the centers of greatest population.

Natural gas and natural gas-gasoline—

Data published by the Texas Railroad Commission indicate that the production of natural gas totaled about 1100 billion cubic feet in Texas during 1938, an increase of 11 per cent over 1937. This figure includes about 45 billion cubic feet used for repressuring and recycling, 50.5 billion extraction loss at gasoline plants, and 137 billion blown to the air. Exports to other states amounted to 203 billion cubic feet in 1937, and imports amounted to 55 billion cubic feet. Natural gas is produced in many counties of the State and is available at present for consumption in most counties of the State.

The production of natural gas-gasoline amounted to 685 million gallons in Texas during 1938. The chief producing areas are in the Panhandle and East Texas, with substantial production from west-central, Gulf Coast, and other parts of Texas.

Petroleum — Texas produced during 1938 39.2 per cent of all the petroleum produced in the United States and 24 per cent of the world production. Petroleum is produced in a large number of the counties of the State. All counties of the State are possible potential producers of petroleum except a few counties in the Central Mineral region and possibly a few counties in Trans-Pecos Texas.

Potash—The Permian basin of Texas and New Mexico contains large deposits of potash salts. The present production is from New Mexico. The chief potash

mineral encountered in Texas is polyhalite. Methods of refining this mineral have been developed at The University of Texas, and its value for agricultural use has been demonstrated. The chief polyhalite areas are in Ector, Midland, Crane, Upton, Crockett, and Irion counties.

Salt — Texas is abundantly supplied with salt. One of the largest salt masses in the world occupies the Permian basin of West Texas. Many other large salt dome masses are present in the Gulf Coast and east Texas area. Five plants produced salt in Texas during 1938. Two of these mined salt, two evaporated salines to produce salt, and one plant used brine.

Sand and gravel—Texas has large deposits of sand and gravel in many parts of the State. Some counties are deficient in these materials, namely, some of the West Texas plains counties and some of the east Texas counties. Deposits of sand and gravel suitable for highway construction have been located near the place of use on several occasions by the Work Projects Administration Mineral Resource Survey sponsored by The University of Texas Bureau of Economic Geology.

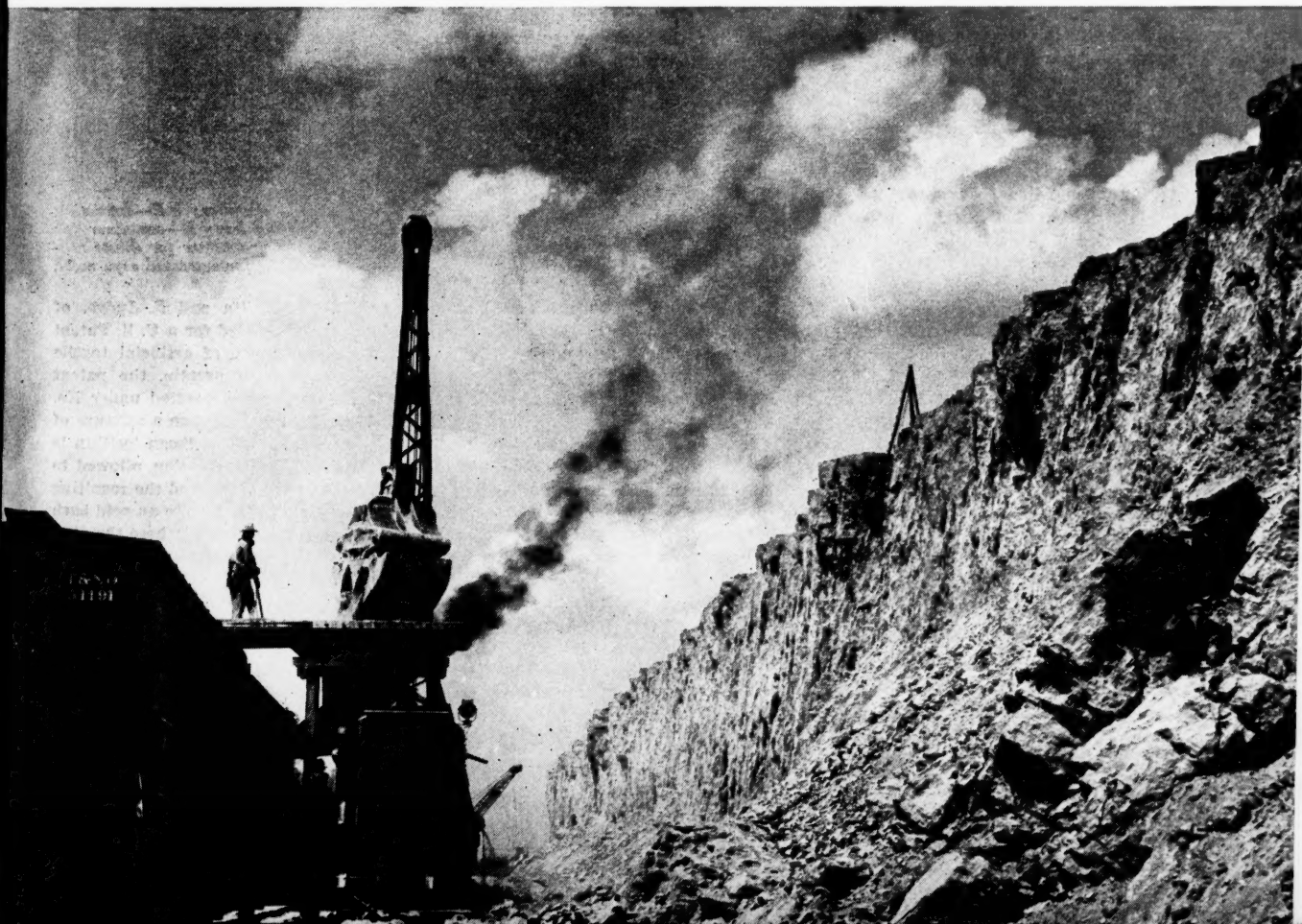
Sodium sulphate — This salt is produced from Ward, Lynn, and Terry counties. Other counties in this area are known to have sodium sulphate containing lakes and playas.

Stone—Texas is blessed by a variety

of building stone seldom equalled in any area of similar size in the world. Most of these stones are located in the central portion of the State, and some areas such as the Gulf Coast and western plains are deficient in building stones. The Central Mineral region, comprising Llano, Burnet, Mason, Blanco, Gillespie, San Saba, and McCulloch counties, contains the chief deposits. A large number of granites ranging widely in color and in texture are available. Some of the gray granites are very superior in quality, and the so-called "opaline granite" (quartz porphyry) is unique in that the quartz is opalescent. This stone also has the remarkable crushing strength of 38,000 pounds per square inch. Marble of pre-Cambrian and Paleozoic age is abundant in a wide range of colors. Serpentine (verde antique) is present in Llano, Gillespie, and Blanco counties. Black marble is present in the Marble Falls formation. Dolomites are present in large quantities in the Ellenburger formation. Limestones are available in several Lower and Middle Cretaceous formations. A notable production of limestone under the trade names of "Cordova cream" and "Cordova shell" is made from the Cedar Park member of the Walnut formation. The "Cor-

(Continued on page 52)

Box car loading at sulphur vat of the Texas Gulf Sulphur Company, Newport, Texas.



THE INDUSTRIAL OUTLOOK FOR SOYBEANS

BY

A. A. Horvath

Director of Research, Horvath Laboratories, Inc., Chambersburg, Pa.

WITH our 1939 soybean crop of 87,000,000 bushels and an expected expansion of this year's crop to over 100,000,000 bushels, there appears to be a growing consciousness of the potentialities of the soybean through direct processing, as well as through the medium of chemical conversion.

The crushing of the beans for oil and meal by the hydraulic press, the expeller, or the screw press, constitutes today the major industrial outlet for the beans. By these methods, the oil comprises only about one-seventh of the weight of the beans, while the cake or meal comprises approximately six-sevenths. The demand for soybean meal has been for years the limiting factor for the expansion and volume of our domestic oil milling industry. Soybean oil meal is being used almost exclusively for feeding live stock, competing with our cotton seed and flaxseed meal, the market price for which is a major basis for determining the price to be paid for the new soybean crop.

It is evident that in order to insure a fair price for commercial beans to the American farmer, whose well-being is the backbone of our prosperity, as well as to enlarge the slim margin of profits of the Southern Soybean Oil Miller, it is necessary to remove the major part of today's soybean oil meal from the highly competitive and crowded feed channel and to convert it into products of higher market value. Such a move would also have a favorable effect on the price for cottonseed and flaxseed meal, thus helping in the recovery of another agricultural commodity.

Recently, the possibilities of soybean oil meal as a spray material have attracted much attention, and it has been recommended as a spreader for lead arsenate, as oil emulsifier, and for making dusting sulfurs wettable as well.

While the commercial soybeans contain an average of 20 per cent oil, 2 per cent phosphatides (mainly lecithin and cephalin) and 40 per cent protein, and

while the protein is being denatured by heat in the expeller and the hydraulic press and is thus rendered unfit for industrial purposes, and the meal still contains about 5 per cent of oil, it is evident that the extraction of the oil by organic solvents, when properly conducted, offers advantages in these respects, besides giving a higher yield of oil and permitting the proper extraction of the phosphatides as well.

The future in soybean oil milling undoubtedly belongs to the solvent extraction process, but its slow progress in this country up to the present time was due mainly to the non-availability on the American market of a continuous unit which would be safe, economical and available at a reasonable price in units of various capacities.

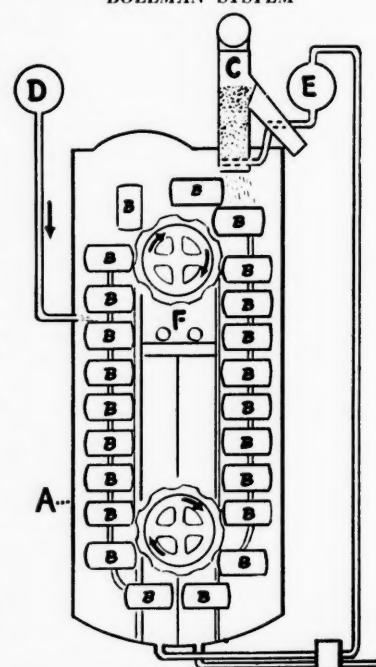
It is of interest that the first solvent extraction unit for soybeans was established about fifteen years ago at Atlanta, Ga., using the Bollman system, which system is today still considered as perhaps basically the best, a proof of which is the fact that American made units based on the Bollman principle are soon to become available, as the Bollman patent expires in 1940.

The Bollman process permits also the use of so-called "azeotropic" mixtures of two solvents, which ultimately separate into two layers, the one containing the oil, the other containing the phosphatides. While in this country low boiling cuts of gasoline are today the preferred solvents, extraction by gaseous hydrocarbons from natural gas under pressure is attracting much attention, as it permits the ultimate removal of the solvent from the meal by simply reducing the pressure in the extraction chamber, instead of having to resort to vacuum in order to avoid overheating which causes denaturing of the protein and renders it unfit for many purposes, among them for plastics, a field which was thoroughly covered twenty years ago by the Japanese investigator Sadakichi Satow, his findings being revealed in voluminous publications as well as in numerous U. S. Patents, most of which have already expired, thus opening the fields of soybean plastics to all concerned. It was Satow who established the properties of liquid

protein-formaldehyde solutions which are suitable for the manufacture of laminated plastics, and Satow as well developed the so-called "Dry Process" for making mixed soya protein-phenol-formaldehyde plastics.

The other uses for soybean protein, for adhesives, sizing for paper, water-paint, and wall-paper like compositions were also outlined by Satow, who recommended the use of alum, formaldehyde, etc., and emphasized the formation of water-insoluble compounds by treating soybean protein with caustic lime, a fact established as early as 1912 by the Frenchman Beltzer.

BOLLMAN SYSTEM



A—extraction chamber; B—extraction boxes; C—feeding box; D—container for fresh solvent; E—container for dilute miscella; F—chamber for extracted soya meal.

In 1937 T. Kajita and R. Inoye, of Tokyo, Japan, applied for a U. S. Patent on the manufacture of artificial textile fibre from soybean protein, the patent having recently been granted under No. 2,192,194. By this invention a mixture of soybean protein with soybean lecithin is dissolved in alkaline solution, allowed to mature for a few days, and the resulting viscous solution is spun into an acid bath containing formaldehyde, where the fibre is solidified. According to this invention an artificial fibre of superior quality is obtained, resembling wool or natural silk with a remarkable tensile strength. This fibre has been produced in Japan on a commercial scale for the last few years under the trade name "Silkwool," and the cloth from such fibre, in quantities sufficient for a suit, is said to cost only slightly over one dollar.

While in textile fibre soybean lecithin (probably the mixed phosphatides) is responsible for its lustre and elasticity, it has many other uses which have been known for years. Commercial mixed soybean phosphatides contain usually about 40 per cent of some oil as a carrier, but a German publication of 1931 describes also the preparation of transparent aqueous solutions. Soya phosphatides possess pronounced emulsifying properties, and are used in the tanning industry, in margarine, in the manufacture of candy, for cosmetics, soap, etc. According to U. S. Pat. No. 2,006,227 soya phosphatides by themselves possess the properties of contact insecticides. They furthermore decidedly enhance the toxicity of nicotine, and are compatible with other contact insecticides such as pyrethrum and rotenone preparations.

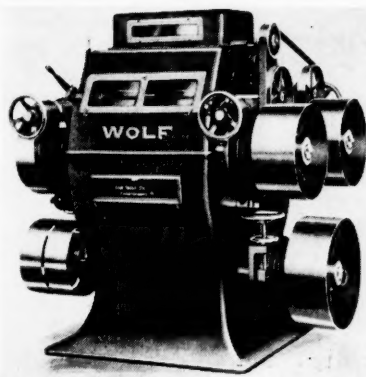
An outstanding new application was discovered a few years ago by the Southern Wood Preserving Company of Atlanta, Ga., namely in the creosoting of wood. The addition of 0.5 per cent to 2 per cent of phosphatides to commercial creosote changes the viscosity and the surface tension of the oil, and reduces the interfacial tension between the oil and any water with which it comes in contact. Creosote to which phosphatides have been added penetrate the sapwood of pine poles readily. When poles are treated with creosote and phosphatide the distribution of the preservative in the sapwood is more uniform than in an ordinary empty-cell treatment, the usual heavy concentration of the oil in the outer annual rings is reduced, and the tendency of the poles to bleed is eliminated.

The Southern States, with their enormous resources of southern pine, and the necessity of protection for the wood against termites, seem to be predestined to become the largest consumers of soybean phosphatides, a by-product in the extraction of the beans by organic solvents. The solvent extraction meal, in turn, may find an unlimited outlet as sizing material for paper of the southern pulp mills.

The South is also badly in need of a high grade protein at low price to supplement the deficient diets and to combat malnutrition which according to Bulletin No. 328 of the University of Florida manifests itself in that state in 40 per cent of all the High School children being definitely anemic. At the University of Rochester Medical School the high potency of soybeans in building blood proteins placed it in a class with liver.

As early as 1915, Dr. Ruhrh of Baltimore discovered that soybean flour is of great value for feeding children, is readily digested, and is particularly useful as a food in summer diarrheas. A few years ago the Dionne quintuplets were relieved from severe bowel infection by soybean preparations.

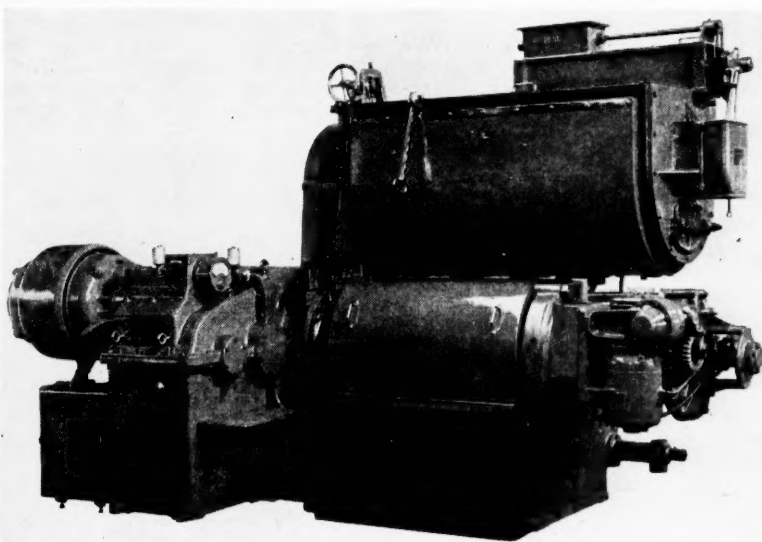
By proper processing, the beany flavor



is being removed, and an edible whole soya flour is obtained which has a pleasant nutty taste, and is being sold today at a substantial margin of profit, to be incorporated in bread, cake, macaroni products, pancake flour, baby foods, doughnut mixes, plum and fig puddings, for cocoa-malt milk shakes, as well as in mixes for biscuits, spoon bread, hoe cake, etc. On the other hand, the one-half of the oil can be pressed out of the previously deodorized beans by cold pressing, and the resulting products reduced by special roller mills and sifters to a low fat flour which finds a ready market as binder in the manufacture of sausages. In this way, the thousands of hydraulic presses of the Southern cotton mills, which stay idle, can be put to work on a very profitable basis.

The Southern States have also every chance to become a center for the manufacture of paint and varnishes containing a certain proportion of soybean oil

Above—The Wolf flour milling equipment like the French pressure oil mill illustrated below together with the Bollman system for solvent extraction represent the most modern methods for soya bean processing.



blended with some tung oil or perilla oil. While soybean oil is classed among the semi-drying oils, it is essential to remove from the oil the phosphatides as they inhibit the drying. The fundamentals for the uses of soybean oil in paints have been studied by Gardner in 1919, and the use of lead, cobalt and manganese dryers recommended. High-grade non-yellowing enamels were recently obtained from blends containing soybean oil with titanium pigments. When cooked with Bakelite or rosin extra good varnishes are obtained.

The farmers of Illinois, where over 10 per cent of all the farm buildings are painted with soybean oil paint, set a good example to the other soybean growing states. In Illinois the executive mansion of the governor is also painted with soybean oil paint.

The aluminum soap of soybean oil, when mixed with cement, renders it waterproof, without affecting its strength. The oil itself has recently found application for foundry cores and is being recommended as a good cutting fluid, superior to linseed or mineral oil.

Today, the major outlet for soybean oil is in the edible field, for shortening and mayonnaise. The striking new development in refining soybean oil is by molecular distillation.

There seems today to be a strong movement on hand in the Middle Atlantic states to regain the leading position in soybean growing as well as in industrial soybean developments which was theirs twenty years ago, and one can only welcome such constructive steps as exemplified by the Soybean Conference in January 24th of this year at the North Carolina State College of Agriculture where a memorandum on soybeans was presented by G. A. Cardwell, General Agricultural Agent, Atlantic Coast Line Railroad Company.

Greater Prospects

Seen for

Industrial South

five months'

contracts total

\$322,912,000

in South

EXPANSION of aircraft manufacturing loomed on the Southern industrial horizon at the end of May, as a survey of industrial construction possibilities revealed such projects either placed under contract or in the plan stage during the month at widely separated points.

Likelihood that the South's aircraft manufacturing industry is due for substantial additions comes as a \$1,000,000 plant for this purpose nears completion at Nashville, Tenn., and propositions for establishing others are under way or projected in Virginia, Florida, on the Gulf Coast and in Texas. Maryland, one of the country's outstanding airplane producing States, may also be slated for expansion, with the Fairchild plant located at Hagerstown and the big Martin plant, at Baltimore. No announcement has been made by the Martin interests, but Fairchild has made known its intention to erect an addition at Farmingdale, Long Island.

Horace E. Dodge, of Detroit, Mich., and associates are reported to be planning a large aircraft engine and plane plant at Newport News, Va. D. Harold Byrd, Dallas oilman and aviation enthusiast, announced that the Lone Star State is being considered as the site for a large similar enterprise.

Activity in other industrial lines, according to a review of items published in the CONSTRUCTION daily bulletin, covering the sixteen States of the South, showed that steps were taken during May toward carrying out important projects in various fields, among which were the food, beverage, textile, chemical, oil and utility

ties industries.

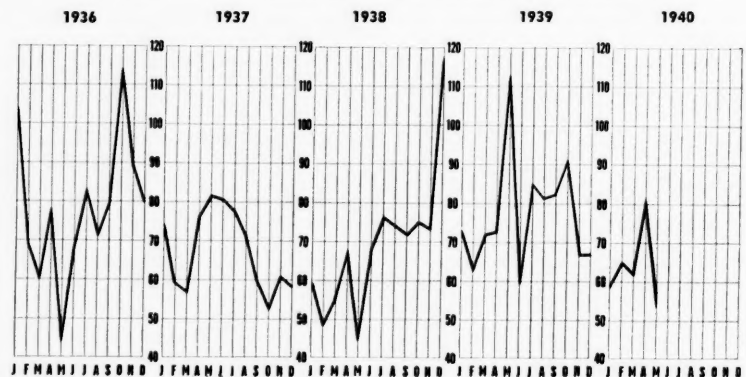
Among the outstanding projects listed during the month were those of the Celanese Corporation of America, which selected the contractor for buildings to cost \$300,000 at its Narrows, Va., plant; of Southern Natural Gas Co., Birmingham, which awarded a \$500,000 compressor contract in connection with its Louisiana-Birmingham-Atlanta pipeline; of Appalachian Electric Power Co., which contracted for a \$260,000 boiler installation at Kenova, W. Va.; of P. M. B. Self, who made the awards for a large cottonseed processing plant at Marks, Miss., and of Erwin Cotton Mills, Durham, N. C., which placed orders under a \$100,000 power plant program. Tennessee Coal, Iron &

Railroad Co., Birmingham, Ala., at the same time started preparatory construction on a \$5,000,000 tin plate mill addition.

Shell and Standard Oil interests continued working on plans for a \$20,000,000 pipe line to be constructed from Louisiana to the Carolinas. Florida Pulp and Paper Co. made preparations to start construction about June 1 on its proposed \$2,000,000 plant at Pensacola, Fla., and Continental Oil Co., Ponca City, Okla., prepared to start work on a \$4,000,000 refinery.

Other expansions in the gas and oil industry included that of Pure Oil Co., Tulsa, Okla., for a thermal polymerization plant at Smith's Bluff, Texas; of the Gasoline Producing Corp., which let contract for a recycling plant in the Grapeland Field of Texas; and of E. C. Johns-

Southern Construction Trends by Months



At the left is a view of the machine room of Champion Paper and Fibre Company's \$3,500,000 paper mill as it nears completion at Pasadena, a short distance from Houston, Texas. The mill, which is Champion's third for manufacture of paper, will produce high grade coated papers at high speed expressly for Time and Life magazines. Cost of the Fourdrinier machine is placed at a million dollars. With an overall length of 400 feet, it will operate at 1,500 feet per minute and is said to be the world's largest combination paper making and coating machine.

PRIV
BU
As
u
Col
s
Re
in
OM

IN
PUB
BU
Cl
Ho
Sch

ENG
Da
F
Sew

ROA
T

ton,
site
refin
Ch
by th
noog
ratio
plant
plans
at Mo
phosp
bide
on a
Rio
which
citrus

Fra
has v
bottli
Bakin
limin
dition
spend
ington
soon
ton, T
000 t
same
Tul
receiv
mac
make
and v

S

Alaba
Arkans
Dist, c
Florida
Georgi
Kentuc
Louisia
Maryla
Mississ
Missou
N. Car
Oklaho
S. Caro
Tennes
Texas
Virgini
W. Vir

TOT

J U

Statistics of South's Construction

	May, 1940 Contracts Awarded	May, 1940 Contracts to be Awarded	Contracts Awarded First Five Months 1940	Contracts Awarded First Five Months 1939
PRIVATE CONSTRUCTION				
BUILDING				
Assembly (Churches, theatres, auditoriums, fraternal)	\$1,209,000	\$3,595,000	\$7,130,000	\$6,805,000
Commercial (Stores, restaurants, filling stations, garages, etc.)	3,711,000	2,227,000	13,776,000	12,223,000
Residential (Apartments, hotels, dwellings)	10,345,000	7,627,000	42,832,000	41,927,000
Office	907,000	415,000	3,114,000	11,298,000
	\$16,172,000	\$13,774,000	\$66,852,000	\$72,253,000
INDUSTRIAL	\$4,968,000	\$35,207,000	\$66,769,000	\$42,751,000
PUBLIC CONSTRUCTION				
BUILDING				
City, County, State, Federal	\$7,611,000	\$8,084,000	37,052,000	\$64,010,000
Housing	4,402,000	6,143,000	35,757,000	22,175,000
Schools	2,087,000	6,924,000	9,360,000	39,644,000
	\$14,100,000	\$21,151,000	\$82,169,000	\$125,829,000
ENGINEERING				
Dams, Drainage, Earthwork, Airports ..	\$2,247,000	\$1,977,000	\$21,414,000	\$28,587,000
Federal, County, Municipal Electric	3,514,000	1,736,000	23,956,000	28,830,000
Sewers and Waterworks	919,000	6,667,000	3,834,000	14,568,000
	\$6,680,000	\$13,380,000	\$49,204,000	\$71,983,000
ROADS, STREETS AND BRIDGES	\$12,218,000	\$11,122,000	\$57,918,000	\$86,660,000
TOTAL	\$34,138,000	\$124,634,000	\$322,912,000	\$393,476,000

ton, of Longview, Texas, who acquired a site at Vicksburg, Miss., for erection of a refinery.

Chemical plant projects were proposed by the Morningside Chemical Co., Chattanooga, Tenn., which had plans in preparation for a \$150,000 chemical products plant; by Monsanto Chemical Co., which plans additional electric furnace capacity at Monsanto, Tenn., to raise its elemental phosphorus production; by National Carbide Corp., Ivanhoe, Va., which proceeded on a furnace building addition; and by Rio Grande Valley By-Products Corp., which will erect a plant to manufacture citrus by-products for use in medicinals.

Frankenmuth-Kentucky Brewing Co. has work ready to start on a \$250,000 bottling plant at Louisville, Ky. Malbis Baking Co., Mobile, proceeded with preliminary plans for a \$300,000 bakery addition. International Nickel Co. will spend \$132,000 for improvements at Huntington, W. Va. John Deere Plow Co. will soon ask bids on a \$150,000 plant at Houston, Texas. Santa Fe announced a \$500,000 track improvement program in the same State.

Tubize-Chatillon Corp., Hopewell, Va., received bids for a plant addition. Potomac Edison Co., Maryland utility, will make \$115,000 improvements in Frederick and vicinity and Nantahala Power Co.

filed notice with the Federal Power Commission of its intention to resume work on a hydroelectric project in North Carolina.

Southern construction of all types in May totaled \$54,138,000, or a little less than thirty-four per cent below that for the preceding month. Work undertaken so far this year in the sixteen States showed a smaller percentage of decline. The 1940 total, as summed up from items published in the Construction daily bulletin, is \$322,912,000. For the comparable period of 1939 the total was \$393,476,000.

Government building, which was bolstered by accelerated activity at several army and navy air bases; commercial projects, such as stores and restaurants, and bank and office work were the only types of contracts showing increases in May. Public housing and private residential work were both down, the percentages of loss in May from the preceding month being higher in the public than in the private field.

Road construction in May was less in volume than during the month before, although the \$12,218,000 May figure was well ahead of the February and March totals for this type of construction. The total of road contracts let in the Southern States for the first five months is \$57,918,000.

Southern Construction

(By States)

	May, 1940 Contracts Awarded	May, 1940 Contracts to be Awarded	Contracts Awarded First Five Months 1940
Alabama ..	\$7,027,000	\$1,580,000	\$17,057,000
Arkansas ..	551,000	1,458,000	5,919,000
Dist. of Col.	3,254,000	1,405,000	21,180,000
Florida	8,143,000	9,423,000	36,518,000
Georgia	3,500,000	2,873,000	18,233,000
Kentucky ...	1,593,000	2,063,000	12,245,000
Louisiana ..	1,993,000	23,081,000	22,295,000
Maryland ...	5,431,000	3,372,000	26,847,000
Mississippi ..	1,022,000	4,284,000	10,920,000
Missouri ...	5,543,000	5,800,000	24,679,000
N. Carolina ..	1,507,000	20,359,000	9,381,000
Oklahoma ...	458,000	1,265,000	7,064,000
S. Carolina ..	1,628,000	1,804,000	8,293,000
Tennessee ...	2,586,000	3,415,000	22,405,000
Texas	5,501,000	28,715,000	55,193,000
Virginia	1,755,000	7,878,000	15,221,000
W. Virginia ..	1,746,000	5,850,000	9,372,000
TOTAL ..	\$34,138,000	\$124,634,000	\$322,912,000

Industrial

(Industrial, Electric Railways, Railroads, Buses, Telephones, Docks, Steamships)

	May, 1940 Contracts Awarded	May, 1940 Contracts to be Awarded	Contracts Awarded First Five Months 1940
Alabama ..	\$565,000	\$140,000	\$3,125,000
Arkansas ..	45,000	75,000	2,984,000
Dist. of Col.	200,000	329,000
Florida	128,000	2,220,000	5,931,000
Georgia	265,000	165,000	1,241,000
Kentucky ...	250,000	55,000	2,900,000
Louisiana ..	83,000	21,085,000	3,557,000
Maryland ...	160,000	214,000	2,746,000
Mississippi ..	50,000	345,000	2,534,000
Missouri ...	760,000	125,000	2,562,000
N. Carolina ..	296,000	660,000	1,318,000
Oklahoma ...	75,000	3,202,000
S. Carolina ..	373,000	40,000	2,523,000
Tennessee ...	75,000	1,155,000	8,853,000
Texas	1,372,000	3,861,000	12,810,000
Virginia	456,000	4,105,000	5,178,000
W. Virginia ..	15,000	732,000	4,976,000
TOTAL ..	\$4,968,000	\$35,207,000	\$66,769,000



**YOU GET A
Double Saving
WITH THIS DOOR**

The economy of Kinnear Rolling Doors is twofold! First, their convenient, space-saving upward action reduces operating costs. Second, their durable, all-steel construction keeps maintenance costs down!

Consider these advantages! They save space — permit full use of all floor and wall area around the opening. They open out of reach of damage by wind, trucks, or other vehicles. They're counterbalanced for smooth, easy operation — and are never hampered by snow, ice or swollen ground. They offer rugged, all-metal protection against fire, weather, riot, theft and intrusion. And every Kinnear Rolling Door is made to fit the individual requirements, assuring easy installation and foolproof operation. Built any size, for old or new openings, with motor or manual control. The Kinnear Manufacturing Company, 1600-20 Fields Ave., Columbus, Ohio.

**SEND FOR THIS 1940
KINNEAR CATALOG**
Write Today
**KINNEAR
ROLLING DOORS**

New Industrial Plants and Expansions in the South During May, 1940

Contracts Awarded

Ala., Anniston—Anniston Manufacturing Co.; feed water heater installation	\$20,000
Ala., Birmingham—Tennessee Coal, Iron & Railroad Co.; tin plate mill addition	5,000,000
Ala., Mobile—Malbis Bakery Company; plant	300,000
Ala., Montgomery—Southern Bell Telephone Company; exchange building	
Ark., Monticello—Apte Brothers; canning plant	
Ark., Jonesboro—Southern Bell Telephone Co.; building	
Ark., St. Joe—L. R. Brantingham; lime plant	
Fla., Jacksonville—Winn & Lovett Grocery Co.; cold storage plant	13,250
Fla., Miami—Crowley's Milk Company; cold storage building	
Fla., Miami—Sears, Roebuck & Company; service station	45,000
Ga., Atlanta—Blue and Gray Transportation Co.; freight depot	
Ga., Atlanta—Harris Manufacturing Co.; factory	
Ga., Atlanta—Wilson Brothers; motor truck terminal	12,000
Ga., Macon—Georgia Power Company; steam plant	
Ga., Macon—Juliette Milling Co.; storage plant	
Ky., Louisville—Frankenmuth-Kentucky Brewing Co.; bottling plant	250,000
La., Alexandria—Southern Bell Telephone & Telegraph Co., Inc.; office building	
La., Shreveport—Sloan Manufacturing Co.; garment plant	28,900
La., Shreveport—P. Lorillard Co.; air conditioning	10,000
La., Shreveport—Calvert Distilling Co.; rack warehouse	
La., Sparrows Point—Rheem Manufacturing Co.; plant	
Miss., Jackson—Dr. Pepper Bottling Co.; building	14,969
Miss., Vicksburg—Tri-State Transit Company; bus station	
Mo., Kansas City—Orscheln Brothers Truck Lines; terminal	
Mo., St. Louis—R. E. Funston Company; nut plant	30,000
Mo., St. Louis—J. H. R. Investment Co.; auto salesroom and service building	75,000
Mo., St. Louis—A. Leschen & Sons Rope Co.; factory	
Mo., St. Louis—Patricia Kathleen Realty Co.; garage and warehouse	
Mo., St. Louis—Primm Tesson Realty Co.; factory alterations	12,000
N. C., Durham—Durham Telephone Co.; cable system	10,000
N. C., Shelby—Shelby Nehi Royal Crown Bottling Co.; plant	30,000
Okla., Barnsdall—Bareco Oil Company; refinery	40,000
S. C., Charleston—Charleston Coca-Cola Bottling Co.; plant	75,000
S. C., Charleston—Seaboard Air Line Railway Co.; wharf and warehouse	48,000
S. C., Chester—Borden Company; milk plant	50,000
S. C., Greenville—Greenville Linen Supply Co.; building	200,000
S. C., Greenville—Keys Printing Company; plant	50,000
S. C., Lancaster—Spring Cotton Mills; warehouse extension	15,000
S. C., Rock Hill—Arcade Mills; plant extension	
S. C., Rock Hill—Industrial Cotton Mills Co.; addition	
S. C., Taylors—Southern Bleachery & Print Works, Inc.; addition	50,000
Tenn., LaFollette—Reade Manufacturing Co.; textile plant	
Tenn., Nashville—Mrs. Frances Sanders; truck terminal and warehouse	14,000
Tenn., Paris—Whitney Transfer Co.; terminal and warehouse	
Tex., Austin—Pitts Ice Company; ice plant	122,000
Tex., Beaumont—Southwestern Bell Telephone Co.; cable	
Tex., Coleman—Southwestern State Telephone Co.; building	
Tex., Corsicana—Dr. Pepper Company; plant remodeling	
Tex., Dallas—Fort Motor Company; plant expansion	350,000
Tex., Dallas—Willard Storage Battery Co.; expansion program	75,000
Tex., Fort Worth—A. Brandt Upholstering Co.; addition	18,000
Tex., Galveston—Graugnard's Bakery; plant	
Tex., Houston—Reed Roller Bit Company; plant addition	15,000
Tex., Houston—Well Equipment Manufacturing Corp.; plant addition	
Tex., Lubbock—Dalby Motor Freight Line; freight depot	22,275
Tex., San Antonio—United Aero Corporation; office building	
Tex., San Benito—Central Power & Light Co.; remodeling building	
Tex., Temple—Gulf Oil Corp.; improvements and alterations	
Va., Hopewell—Tubize-Chatillon Corp.; plant addition	17,888
Va., Ivanhoe—National Carbide Corp.; furnace building addition	
Va., Lynchburg—Allen-Morrison Sign Co., Inc.; plant addition	
Va., Newport News—Chesapeake & Ohio Railway Co.; station	25,000
Va., Richmond—Strietmann Biscuit Co.; plant	50,000
Va., Roanoke—Lindsey, Robinson & Company; warehouse and feed plant	30,000
Va., Roanoke—Norfolk & Western Railway Company; locker room	
Va., West Graham—Imperial Ice Cream Company; plant	50,000
W. Va., Charleston—Superior Laundry; building	
W. Va., Huntington—Appalachian Electric Power Co.; new boiler	260,000
South—Chesapeake & Ohio Railway; equipment	500,000
South—Southern Natural Gas Co.; equipment	275,000
South—Southern Railway System; equipment	

Contracts Proposed

Ala., Birmingham—Try Me Bottling Co.; plant addition ..	\$25,000
Ala., Selma—Dixie Asphalt Corp.; plant	
Ala., Sheffield—Southern Cotton Oil Co.; building	18,000
Arkansas—Arkansas Power & Light Co.; transmission line ..	
Ark., Altheimer—Whiteside Farms; canning factory	
Ark., Jonesboro—Clarence A. Johnson; stockyard	25,000
Ark., Little Rock—Willis V. Lewis; truck terminal and filling station	
D. C., Washington—Chesapeake & Potomac Telephone Co.; plant and equipment	216,000
Fla., Jacksonville—General Truck Co.; building	
Fla., Jacksonville—Southern Bell Telephone & Telegraph Co.; exchange building	
Fla., Miami—R. C. Collins; garage	
Fla., Miami—Seminole Docks; dry storage shed	
Fla., Tampa—Louisville Drying Machinery Co.; cattle feed plant	40,000
Ga., Albany—Albany Paper Co.; building	
Ga., Atlanta—Atlanta Constitution; building	
Ga., Dawson—Dawson Cotton Oil Co.; fertilizer plant	10,000
Ga., Marietta—Economy Ice Cream Co.; plant	40,000
Ga., Monroe—Monroe Coca-Cola Bottling Co.; plant	
Ga., Savannah—Thigpen & Strickland Lumber Co.; wharves ..	
Ky., Louisville—Buckeye Cotton Oil Co.; processing plant ..	75,000
Louisiana—Standard Oil Company of N. J.; gas pipe line ..	15,000,000
La., Covington—Smith Chevrolet Company; service building ..	
La., Lake Charles—Continental Oil Co.; refinery	4,000,000
La., Shreveport—Shreveport Journal Publishing Co.; addition ..	
La., Shreveport—Texas & Pacific Railroad; terminal	
Md., Baltimore—American Oil Company; drum conditioning building	
Md., Baltimore—I. Sekine Co., Inc.; brush plant	50,000
Md., Chestertown—Kents Boat Company; plant	
Md., Frederick—Potomac Edison Company; improvement program	115,000
Miss., Amory—Amory Advertiser & Amory News; consolidation ..	
Miss., Ellisville—Jones County Hosiery Mills; mill	30,000
Miss., Marks—P. M. B. Self; cottonseed oil mill plant	
Miss., Meridian—Meridian Hosiery Mill; additional machinery ..	
Miss., Meridian—Southeastern Box Company; additional machinery ..	
Miss., Vicksburg—E. C. Johnston; oil refinery	
Miss., Yazoo City—E. C. Johnston; oil refinery	
Mo., Kansas City—Campbell 66 Express Company; terminal ..	300,000
Mo., St. Louis—American Stove Company; addition	
Mo., St. Louis—Chapman Knives & Saws, Inc.; cutlery plant ..	
North Carolina—Nantahala Power Company; hydro-electric development ..	
N. C., Charlotte—Horace E. Dodge & Associates; plane and engine plant	
N. C., Charlotte—Transit-Mix Concrete Co.; plant	40,000
N. C., Greensboro—Greensboro Overall Company; plant addition ..	50,000
N. C., Hickory—Hollar Hosiery Mill; equipment installation ..	
S. C., Columbia—Dreher Sausage Company; plant improvements ..	15,000
S. C., Inman—South Carolina Peach Growers' Assn.; peach cannery	
Tenn., Carthage—Smith County Locker Storage Co.; locker plant	150,000
Tenn., Chattanooga—Morningstar Chemical Co.; plant	
Tenn., Chattanooga—Texas Company; river terminals	
Tenn., Kingsport—Latimer-Looney Chevrolet, Inc.; building ..	
Tenn., Memphis—Tobias Bag Company; plant	
Tenn., Monsanto—Monsanto Chemical Co.; additional furnace ..	
Texas—Gasoline Producing Corp.; recycling plant	500,000
Texas—Santa Fe Railway; track improvement	
Tex., Austin—Southwestern Bell Telephone Co.; line extensions ..	46,000
Tex., Bishop—Cotton Gin Cooperative; cotton gin	
Tex., Brady—Brady Cooperative Poultry Association; cold storage locker plant ..	
Tex., Bryan—Eagle Printing Co.; plant	
Tex., Denison—Dr. T. J. Long; locker plant	
Tex., Houston—John Deere Plow Company; plant	150,000
Tex., Longview—Southwestern Bell Telephone Co.; wire and cable network addition ..	
Tex., McAllen—Rio Grande Valley By-Products Corp.; canning plant	500,000
Tex., Port Arthur—Greyhound Lines; bus station	22,000
Tex., San Antonio—National Aviation Corp.; plane factory ..	
Tex., Smith's Bluff—Pure Oil Company; polymerization plant ..	
Tex., Waco—Central Freight Lines, Inc.; terminal	
Va., Tazewell—Painter Motor & Machinery Co.; building ..	400,000
Va., Winchester—Chesapeake & Potomac Telephone Co.; building	
W. Va., Charleston—Charleston Tractor & Equipment Corp.; service and office building	
W. Va., Huntington—International Nickel Company; plant ..	132,000



"Accidents like this can cost us a fortune," excitedly shouted the PLANT SUPERINTENDENT.



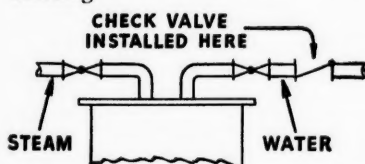
"How in blazes did steam get into that drinking fountain," woefully spoke the MAINTENANCE FOREMAN.



"But it won't happen again," assured the CRANE MAN. "Preventive Maintenance will see to that."

In a midwestern manufacturing plant one day, a worker went for a drink. But, as he stooped over the fountain, instead of refreshing water, there came a blast of burning, blinding steam.

In another department, silicate of soda used for processing was melted in a large vat with a steam coil. The liquid was then cooled by running water through the same coil. A globe valve in each line controlled the water and steam to the coil. The water connection came direct from a 2½-inch main line which supplied the entire building.



A batch of the processing material had been melted and was ready for cooling. The water valve was opened wide. But, the operator forgot to close the steam valve. The 160-pound steam easily forced its way into the water line.

And, it was the thirsty worker who provided an outlet for the angry vapor.

"This must never happen again!" said the Superintendent. A warning to the vat handlers wasn't enough. So he called in W. F. C., the Crane Man, who suggested Preventive Maintenance. The solution to the problem was simple, yet Preventive Maintenance would safely guard against recurrence. It counseled the installation of a Crane No. 74E Brass Check Valve in the water line to the processing vat.

Results: (1) the trouble was permanently remedied. (2) The management has peace of mind about the safety of its employees from this danger. (3) Another manufacturer has learned the sound economy of Preventive Maintenance. Has learned, too, to look to Crane for the valves and fittings for the most economical solution to every piping problem. And, he knows it pays to consult the Crane Representative—always.

This case is based on an actual experience of a Crane Representative in our Kansas City Branch.

CHECK VALVES ARE "TRAFFIC COPS" IN PIPE LINES

In industry there are few piping systems, if any, in which backflow is not dangerous or damaging. Thus check valves are often the most essential valves in a line. They police your piping—keep flow going in the right direction.

Systems lacking adequate backflow control afford the Plant Engineer a valuable opportunity to apply Preventive Maintenance now—before costly damage results to product or equipment, or harm to personnel. To meet the varying operating conditions of industrial piping, Crane makes check valves in a complete range of designs and materials—for all working pressures.

You'll get a lot of satisfaction in Crane No. 74E Brass Check Valves. They're rated at 300 pounds steam, 550", and are built to give superior service. For steam, water, oil or gas lines, they're an outstanding buy. Consult your Crane Representative.



CRANE

CRANE CO., GENERAL OFFICES
836 S. MICHIGAN AVE., CHICAGO
VALVES • FITTINGS • PIPE
PLUMBING • HEATING • PUMPS

NATION-WIDE SERVICE THROUGH BRANCHES AND WHOLESALERS IN ALL MARKETS

NEW WAYS OF DOING THINGS

New Stamped Wing Nuts

For several years the Central Screw Company, Chicago, Ill., has successfully manufactured a standard pattern line of one-piece stamped wing nuts which have been favorably received, but to meet a growing demand for special sizes and shapes required out of stock by the general trade, it has expanded its operation on this type of product. The new line is said to offer broader possibilities for wing nut assembly applications, and because the nuts are manufactured at low



Type 16
Special Low Wings



Type 3
Standard Pattern



Type 14
Special Broad Base

Central Stamped Wing Nuts

cost by a special patented method they offer a considerable saving in cost to the user. These wing nuts are of uniform and sturdy construction, free from burr or sharp edges, made of cold rolled strip steel or sheet brass with holes properly threaded to spin on with ease, while adequate bearing surface insures strong gripping power. All types are available in plain bright finish or plated to meet particular needs. Accompanying illustrations show the new Type 16 Central wing nut with special low wings; Type 3 standard pattern Central wing nut, and Type 10 broad base Central wing nut.

Power-Factor Correction for Fluorescent Lamps

Aerovox Corporation, New Bedford, Mass., announces the introduction of CAPACITORS designed specifically for fluorescent lamp power-factor correction, and which may be included in fixtures as initial built-in equipment, or may be added subsequently. Power-factor correction is declared essential to the economical operation of fluorescent lamps on A.C. Otherwise current consumption may be excessive. These capacitors are of the oil-filled paper type for longest life. Three types are available, taking care of power-factor requirements of the twelve standard types of fluorescent lamps in general use.

Fluorescent Lighting Fixture

Fluorescent lighting for homes, offices and sales rooms is now available in a new artistic fixture of modern streamline design with two, three or four 18-inch or 24-inch fluorescent tubes, according to announcement by the Mozart Specialty Corporation, 1533 N. Ashland Avenue, Chicago, manufacturers. Supplied in English bronze with chromium plated trim, the fixture is available in overall lengths of

39 inches for 15 watt tubes and 45 inches for 20 watt tubes. Fluorescent lighting, it is claimed, produces soft shadow effects which are more pleasing in room lighting than harsh incandescent illumination, while the efficiency in terms of light output per watt is from three to two hundred times greater. One 20-watt fluorescent tube may be considered equal to 60 watts of incandescent illumination. Tubes operate cool and eliminate the objectionable heat of ordinary lighting. Seven colors are available in fluorescent lamps—warm white, daylight, green, blue, pink, red and gold, providing distinctive effects for display illumination. The fixture illustrated, herewith, in a vertical suspension style is also available with link chains for horizontal suspension from low ceilings and with a pedestal as a modernistic floor lamp. The auxiliary reactors, power factor correctors and starting switch are self-contained.



Suspended Fluorescent Fixture

Flexco HD Conveyor Belt Fastener

For joining thin, light weight conveyor belts, which are becoming more and more popular, Flexible Steel Lacing Company, Chicago, Ill., has added a new size to the line of Flexco HD Belt Fasteners. This is the No. 1 1/4 and is used to join elevator and conveyor belts from 5/16-inch to 1/2 inch thick. The holding bolts are large size, yet, because of its short length, the new fastener will travel around pulleys as small as 14 inches in diameter. Constructed and applied as other Flexco HD Fasteners, the No. 1 1/4 has metal plates to span the joint on opposite sides of the belt which are drawn tightly together by two bolts through the belting. Both heads and nuts are countersunk and the protruding bolts broken off, leaving the fasteners flat and smooth on both sides. The fastener makes a tight butt joint and, since this joint is a series of separate fastenings, it can assume the trough of the conveyor as naturally as the rest of the belt.



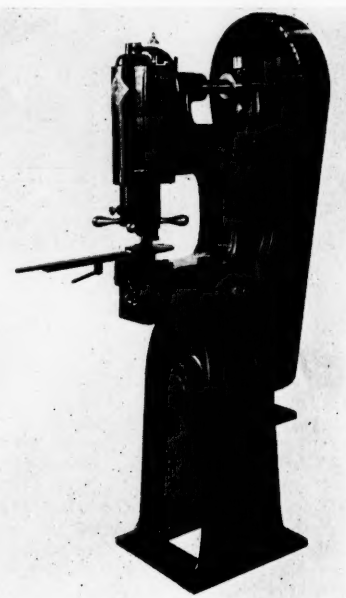
Diagram of Flexco HD Belt Fastener as Installed to Join Conveyor Belts

New Model Nibbling Machine

W. J. Savage Company, Knoxville, Tenn., manufacture the Savage Nibbling Machine which now has been developed to cut sheet metal up to 3/8-inch thick.

The illustration shows the company's latest model No. 212, and according to the manufacturer the new machine was produced to fill trade requirements as to capacity, throat depth and the cutting of stainless and other hard and tough alloy steels now being extensively used.

The Direct-Over-Center Drive feature adds power to the machines. A Totally



Enclosed Revolving Head simplifies operations. Fast and Accurate Cutting of sheets from 0-inch to 1/2-inch is accomplished by following a scribed line, free-hand, and by the use of a guide template.

The patented tool holder and up-set head tool makes it possible to successfully cut stainless and other alloy steels, aluminum, brass, copper and other materials. Starting holes are punched under power, which is quite an advantage when inside cutting is required. Tools and dies are made of high speed steel and may be re-sharpened numerous times.

The Removable Steel Material Support Plate, full depth of throat is an added convenience appreciated by operators. (For throat depths of 18-inch and over.)

A new machine has been added to the line having a capacity of 5/16-inch in mild steel. Sheets 24 inches wide, any length, are handled on this machine due to our revolving head feature which permits cutting at any angle on a 360° circle.

While the Savage Nibbling Machine is well known to the trade, the latest model it is said has many new and improved features. The manufacturer claims: "Where excessive heat is dangerous, or injurious to the metal being cut, the Savage Nibbling Machine meets the requirement. Secondary operations are practically eliminated as there is no distortion to the sheet being cut."

NEW FRONTIERS FOR AMERICAN YOUTH

SOUTHERN college students—and for that matter young people throughout the nation—suffered during the last decade from a chronic attitude of economic defeatism, nurtured under the guise of realism.

This doctrine of lost horizons, founded on a belief that America's frontiers had either vanished or become unavailable to all but an isolated few, took root in the seeming inability of young men and women to find a niche in the world of business and industry.

One of the causes contributing to the plight of youth during the "dismal thirties" it has been felt, was the absence of close cooperation among the three elements which must function together to equip youth for and provide it with jobs: the men who operate large industries, the men who train future workers, and the young people themselves.

Just how does this affect the new crop of diploma winners?

Dr. Alan Valentine, president of the University of Rochester, working on the premise that students, if allowed an opportunity to talk to the industrial captains of the country, would be able to dispel their "economic blues," conceived and worked out plans for a "clinic" devoted to the discussion of "New Frontiers in American Life."

The results offer new hope and confidence to young people throughout the country.

A council headed by Owen D. Young and including Edward R. Stettenius of the United States Steel Corporation, solicited the assistance of 16 heads of industries which touch almost every phase of American life to lend a hand in making the clinic a significant development in the quest for a right answer to youth's familiar question: "Where do we go after graduation?"

One and all, such leaders as Langbourne M. Williams, Jr., president of Freeport Sulphur Company; David O. Selznick of Selznick International Pictures, Inc.; Arthur G. Hoadley, president of the Middle Western Division of the Great Atlantic & Pacific Company; David Sarnoff of Radio Corporation of America, David M. Goodrich, chairman of the board of the B. F. Goodrich Company, and others dropped their work to take

part in the Rochester discussions, not only to sum up what they regarded as "new frontiers" but also to expose themselves to student questioning at round-table sessions.

Freeport Sulphur has producing properties in Texas and Louisiana; A & P operates with both producers and consumers throughout the South; Selznick's biggest money maker to date has been that Southern saga, "Gone With the Wind," which premiered in Atlanta; R.C.A. is a Delaware firm serving radio stations and affiliates throughout the nation; and B. F. Goodrich operates plants at Silvertown, Ga., and Clarksville, Tenn., among others. Subsidiaries of U. S. Steel are located in Alabama, Texas and Virginia. Consequently, statements of these men have direct significance for ambitious Southern youth.

An important outcome of the clinic was the pattern it laid down for undergraduates and educational institutions throughout the country by men who "have been through the mill."

As the clinic opened, Young advised professors and participants to "preserve and develop the natural confidence, initiative and daring of the men you train." He launched an assault on defeatism by telling prospective graduates that "the spirit makes the age."

"There are great frontiers being unfolded for us every day," Williams remarked. "They are different in form. They are not as easy to find as some of the old frontiers but we have new tools. As it has become harder and harder to find new rich mines, we have been studying and working in the laboratories, and man's imagination has been at work, and we have been storing up a vast accumulation of knowledge that enables us to do things the old pioneers never dreamed of doing."

In pointing out how the new and better tools of present-day technology have virtually created new natural resources where none were believed to exist—with consequent employment—Williams cited several truly modern extraction industries of particular interest to the South. The Dow Chemical company, he said, is earning a million dollars a year by extracting the bromine used in anti-knock gasoline from sea water off the North

Carolina coast—in spite of the fact that only 500 pounds of bromine are obtained from each million gallons of water.

The same company, he added, is now preparing to invest five million dollars in a new plant on the Gulf of Mexico, at Freeport, Tex., where each day 14 tons of magnesium will be recovered from 3,500,000 gallons of sea water—providing industry with a new source of the lightest of all metals and one which is especially valuable in aviation.

Goodrich told the conference that youngsters need to understand and appreciate the system in which they live and work in order to seize the opportunities that await them. "It is the teacher's duty," he said, "to give them right understanding."

"Education itself is our biggest industry," he continued. "There is no product in which all of us have a more vital interest than in the youth of this country."

"The new frontier of synthetic rubber is expanding rapidly, and may well be one of the major developments of our time," he declared in surveying new job opportunities.

"As long as there are unsatisfied human needs, so long is there opportunity for pioneering youth," said Dr. Cole Coolidge, assistant chemical director of the E. I. du Pont de Nemours & Company of Delaware, with subsidiaries throughout the South.

Hoadley added that there are "rich rewards" for those who can reduce distribution costs in practically every line of merchandise. "The key log in our national economy is inefficient distribution," he declared.

Youth, striding forth in a world with institutions and idols "on the pan," got a good tip from Eric Hodgins, vice-president of Time, Inc., and publisher of *Fortune*.

"If youth wants a job," he advised, "the very first thing it has to decide is that work is not the bunk. It must believe that if you want to work, you can get a job." He outlined ways in which young people can get jobs in publishing.

Attractive as are new frontiers, Charles Francis, president of General Foods, and Hoadley agreed on the proposition that, as Francis put it, "we are neglecting fields that form our own good American backyard," fields that "have already been fenced off." Subsidiaries of General Foods are located in Memphis, Tenn.

Present-day opportunities, according to Sarnoff, "give birth to the need that individuals be found with the mental and moral capacity to utilize these gifts of science for the benefit of mankind." They call "for the old-fashioned virtues of faith and courage, as well as for the new fashioned education," he said.

Selznick declared: "Each man's work

(Continued on page 58)



He put it to the "HOB-NAIL" TEST!

Yes, that's what happened in a manufacturer's roughshod test on painted sheets of galvanized ARMCO PAINTGRIP and ordinary galvanized metal.

To compare paint adherence he placed a painted sheet of both metals on the floor in a three-foot hallway. Employees walked on them four times daily—hob-nails and all!

After four months paint on the PAINTGRIP panel was evenly worn but not chipped. Paint on the ordinary galvanized sheet revealed peeling, chipping and flaking caused by brittleness of the paint and lack of adherence.

A decisive test, that! Yet paint adherence is only one of the reasons why ARMCO PAINTGRIP can help you save money and make money. PAINTGRIP needs no pre-treatment, no weathering. Its special bonderized finish takes paint and helps preserve it. There are no surface compounds to dry out paint and rob it of its elasticity.

Why not try ARMCO PAINTGRIP for *your* painted products? Let us send you a working sample of this bonderized metal. Then you can get a good idea of the shop-savings, and the increased service life PAINTGRIP can give your products. Write The American Rolling Mill Co., 1181 Curtis Street, Middletown, O.



ARMCO PAINTGRIP

FINANCE

" " " and " " " INDUSTRY

To Pay As We Go

As this is written the emergency funds requested by the President are given as \$4,000,000,000.

Whatever plans may be proposed, and these run from issuing money without backing to using some of the present gold supply to pay the bill, it should be recognized that the amount is bound to be an additional Federal debt. The fact should be put plainly before the public. They understand the emergency and they will support measures that are put plainly before them if the details are given with frankness and the way shown as to how the debt must be paid.

The best judgment dictates that while this is going on plans should be made not only to retire this unused obligation, but to meet the requirements of a balanced budget. The facts may hurt but they can be faced. Hiding them will do no good and one of the sanest approaches to a balanced budget, so very necessary at once, is to cut to the bone unnecessary expenses which have been entailed by following sociological reform ideas which are impractical and of tremendous cost.

High Taxes Retard Recovery

The Tax Foundation of New York calls attention to the effect high taxes are having in the field of home ownership. Citing the fact that home building is recognized as a springboard for recovery in which every industry would share by providing building material, household equipment, furnishings, etc., and this in turn would lead to increased employment, it says the reason this activity has not materialized is because of burdensome taxation. It proceeds to quote the Federal Home Loan Bank as stating: "The history of the depression records a recession in the cost of nearly everything connected with real estate except taxes. These have become an unbearable burden on the ownership of real estate, a depressant on its value, a deterrent to its sale and a hazard to its economic stability."

Industry's Taxes

The Westinghouse Electric and Manufacturing Company has sent out an announcement to the effect that each employee of the company in 1939 "worked six weeks for the tax collector."

The Company's tax bill increased from \$2,532,000 in 1930 to \$10,390,000 in 1939. This represented \$238 per annum out of the average wage or salary paid employees, as compared with \$55 in 1930.

Elsewhere in this column we have referred to the increasing burden of taxes and the evident sacrifice that will be necessary for all of us to make in meeting increased expenses due to the war. The figures above quoted emphasize, however, the grave necessity of spending wisely what it is necessary to spend and avoiding the hysteria and waste which usually accompany times of rush and excitement.

Electric Earnings Increase

The electrical manufacturing industry has been making notable increases in earnings. Profits of leading companies in this field for the first three months of this year were above the 1937 level, and if future months show similar encouraging returns

(Continued on page 46)

The Arundel Corporation

BALTIMORE, MD.

Dredging—Construction—Engineering

Distributors of Sand - Gravel - Stone and Commercial Slag

A COMPLETE ORGANIZATION

Our complete organization with years of experience in successfully executing large construction contracts of various kinds is prepared to undertake the construction of earth, masonry and concrete dams, drydocks, dredging of all kinds, river and harbor improvements, deepening channels, hydraulic filling and rock work, tunnels, railroad construction, sewers and waterways.

PERSONNEL:

JOSEPH V. HOGAN, President
RICHARD A. FROEHLINGER, Executive
Vice-Pres. & Treas.
W. BLADEN LOWNDES, Vice-President
JOSEPH N. SEIFERT, Secretary & Asst. Treas.
E. L. WADE, Assistant Secretary
T. K. SHAUGHNESSY, Assistant Secretary

C. WARREN BLACK, Vice-President in Charge of
Engineering and Construction
JOSEPH G. KUHN, Vice-President in Charge of Dredging
GEORGE H. BACOT, Vice-President in Charge of
Materials' Production
JOHN A. REILLY, Vice-President in Charge of New York &
New England Areas.

MAIN OFFICE: Arundel Building, Pier 2, Pratt Street
BALTIMORE, MD.

Branches: BROOKLYN, N. Y.—MIAMI, FLA.

AND NOW..RICHMOND'S NEW PORT

Within a short time, the work of transforming the Richmond water terminals into a deep water port at a cost of several million dollars will be completed. A large percentage of all commercial vessels afloat could easily ascend the James and find docking facilities.

Ships will be able to bring their cargoes 100 miles closer inland to great consuming and producing regions and the exceptional road and rail transportation facilities available at Richmond.

First and Merchants, Virginia's largest bank, can readily take care of the banking needs of big business as well as small.

1865 . . . SEVENTY-FIFTH ANNIVERSARY . . . 1940

FIRST AND MERCHANTS

National Bank of Richmond

John M. Miller, Jr., Chairman of the Board

H. Hiter Harris, President

CAPITAL AND SURPLUS SIX MILLION DOLLARS

Member Federal Deposit Insurance Corporation

PLANT SITES in the Seaboard Southeast

In the six southeastern states served by the Seaboard Air Line Railway there are many excellent plant locations suitable for a wide variety of enterprises.

Assets of prime importance include an abundance of raw materials, cheap power, good labor conditions, excellent transportation facilities, quick access to markets, and last but not least, a friendly people who are sympathetic towards industry and its problems.

Detailed reports will be furnished on specific sites upon request. To interested prospects we offer all the benefits of an experienced plant location service without obligation or cost.

WARREN T. WHITE, GENERAL INDUSTRIAL AGENT
SEABOARD AIR LINE RAILWAY, NORFOLK, VA.

Industrial Department
SEABOARD
AIR LINE RAILWAY

We have helped

many businesses that have brought
us their financial problems.

Correspondence invited.

BALTIMORE COMMERCIAL BANK

GWYNN CROWTHER, President

BALTIMORE, MARYLAND

Member Federal Reserve System
Member Federal Deposit Insurance Corporation



*Pensacola
Invites Industry*

Pensacola has what industry wants—good port facilities, marine terminals for the L. & N. R.R. and the Frisco Lines, nearby raw materials, good labor and living conditions, low costs of operation. Investigate Pensacola. For further information write
B. F. Langford, Sec. Mgr., Municipal Advertising Board—

PENSACOLA FLORIDA
on the Gulf

Finance and Industry

Electric Earnings Increase

(Continued from page 44)

they will approach the top figures of 1929.

The increasing use of electricity for all purposes, including power and home consumption, has been one of the bright spots of depression years. Home building which for some time has been mainly in the direction of medium and low priced houses, has sustained a marked demand for labor saving and modern electrical appliances of various kinds, so that both manufacturers and dealers as well as suppliers of current have benefited. This has been accompanied by a general reduction of rates throughout the country due to increased facilities and demand, which in turn have brought more business.

Southern Railway Purchasing Additional Mileage

At the annual meeting of the stockholders of the Southern Railway in May, there was authorized subject to approval of the Interstate Commerce Commission, the purchase by the Southern Railway Company of the rights and franchises and properties of the Georgia Midland Terminal Co., Asheville and Craggy Mountain Railway Co., and Asheville Southern Railway Company. The Georgia Midland property will be acquired subject to the lien of its first mortgage dated April 1, 1896, securing \$1,650,000 of 3 per cent bonds maturing April 1, 1946.

United States Gold

The United States is the possessor of more than two-thirds of the world's gold. Imports of gold during the first four months of this year were \$1,147,492,000, exceeding all previous records for a similar period. This total swelled our gold holdings to over \$19,000,000,000 at the end of April, or 70 per cent of the total stocks of the world estimated at \$26,000,000,000.

France and Britain, including Canada, supplied more than half of the imports. European neutrals sent nearly as much. Included in the amounts were refugee funds from countries at war in Europe, and neutral as well as belligerent countries' balances sent for safekeeping.

The total gold production of \$900,000,000 in 1934 has risen to above \$1,200,000,000 in 1939.

Taxes and Security Prices

In considering taxes, the fact is to be faced that to carry out the defense work ahead of America, as outlined by the President, there must of necessity be a considerable increase in the receipts of government and that means more taxes in variety and amount. It has happened before and must happen again if we are to pay the bill.

America is willing, undoubtedly, to face a situation which will demand sacrifice and hard work on the part of everyone.

The impact upon business in this country of the war abroad, coupled with the defense program under way, is bound to make material changes in many directions. The war is first in men's thoughts and plans of all kinds are being held in abeyance until necessary adjustments take place that will enable this country not only to defend its own shores but to render the fullest possible material help to the Allies.

The security markets, notwithstanding foreign selling of securities have stood up remarkably well. Evidently they reflect confidence in the Allies ultimate victory. If security holders had believed the opposite, despite the alarming blitzkrieg news, prices would have made a more precipitate and sustained decline.

MANUFACTURERS RECORD FOR



Between a winning and losing ball team, a first and second horse, a profitable advertising campaign and a flop—there is often just a thin line.

\$\$\$ Take your own advertising for the coming year. Real success or near-success? Some overlooked factor may be the vital ounce that will tip the balance.

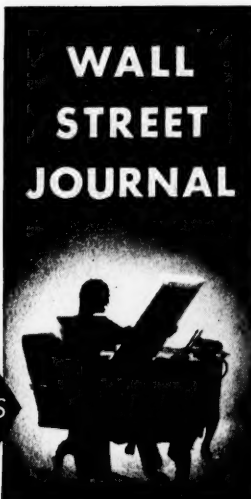
\$\$\$ Suppose a big part of your selling job is to win the approval of higher executives of other companies. Is your advertising really hitting those executives—hitting them in their offices, where *they buy and you sell*?

\$\$\$ 86 per cent of all subscribers to one national executive-publication read it *at their desks*. No other even approaches that figure.

\$\$\$ The one is The Wall Street Journal. And it gives you, per advertising dollar, more readers who are active management-executives of industrial corporations with assets of over \$1,000,000 than any other medium.

\$\$\$ Use it; be on the winning side of *the thin line*.

SELLS MANAGEMENT EXECUTIVES



at point of sale

ELIMINATE DANGERS OF

**SABOTAGE • TRESPASSERS
TROUBLE-MAKERS**



ANCHOR FENCE

**Protects Your Property
Quickly Installed**

Europe's War is presenting a real problem for American Industry because of the increased dangers of sabotage, trouble-making, trespassing. Just as they did 25 years ago, business men are again turning to Anchor Fences to protect their property and prevent interruption of production, lost profits, jeopardy of human life.

Many are completely fencing their plants, others are adding sections at strategic points, still others are extending their fencing to protect plant expansions.

Anchor's Nation-Wide Erecting Service is prepared to install your Anchor Fence immediately. Send for the Anchor Fence Engineer today. He will recommend the proper Anchor Fence installation to completely protect your plant, and show you the many Anchor features which give you extra protection, longer life, lower maintenance costs. Or mail the coupon for free Industrial Fence Catalog today.

MAIL COUPON NOW!

Anchor Post Fence Co.
6622 Eastern Ave.,
Baltimore, Md.

- ☐ Please have Anchor Fence Engineer call.
☐ Send illustrated Industrial Fence Catalog.

Name.....

Firm.....

Address.....

48

INDUSTRIAL NEWS

Trust Is General Traffic Manager U. S. Steel Subsidiaries

Charles W. Trust has been appointed General Traffic Manager of U. S. Steel Corporation Subsidiaries, succeeding William S. Guy who is retiring upon completion of 49 years of service with subsidiaries and predecessor companies of U. S. Steel Corporation. Mr. Guy began his career in steel transportation in 1891 with Carnegie Brothers and Company, and in 1912 became traffic manager of the former Carnegie Steel Company. He became traffic manager of Carnegie Steel Company in 1928 and four years later assumed a similar responsibility for all U. S. Steel Subsidiaries in the Eastern Division, which post he has held since 1938.

Mr. Trust has been associated with the traffic department of Carnegie Steel Company and Carnegie-Illinois Steel Corporation for 36 years, and has been traffic manager of the Eastern Division since 1938. He is president of the Traffic Club of Pittsburgh. In his new position, he will have general supervision over the traffic matters of the steel producing subsidiaries of the Corporation and in addition will continue to serve as traffic manager for American Bridge Company, American Steel and Wire Company, Carnegie-Illinois Steel Corporation, H. C. Frick Coke Company, National Tube Company, and the U. S. Coal and Coke Company.

Handles Largest Transformers

Faced with the problem of handling and installing four 65,000 KVA Westinghouse transformers, declared to be the largest of their kind in the world, engineers for the Los Angeles Department of Water and Power conceived the idea of erecting a giant P&H electric gantry crane at receiving station "E." This 200-ton crane, like others of the gantry type, is equipped to handle exceptionally heavy loads in three motions—up, down, and horizontally. Following a preliminary test, the engineers proceeded with the actual installation, and the big P&H crane lifted, moved and lowered its burdens without a hitch. The transformers weigh 210 tons apiece and represent an investment of \$500,000. After installation, three of them were permanently hooked up, and the fourth will be used as a spare. The P&H crane, made by Harnischfeger Corporation, Milwaukee, Wis., will now function as "stand-by" equipment to be used whenever adjustment or replacement is necessary.

Gibb Promoted By Yale and Towne

Succeeding James C. Morgan who was promoted to the position of General Manager of all its Philadelphia operations, S. W. Gibb has been made General Sales Manager of the Philadelphia Division of The Yale & Towne Manufacturing Company of Stamford, Conn. Mr. Gibb, whose appointment was effective as of April 16, has an experience of 20 years of executive work with the Yale organization, joining the company in 1920 as district sales manager and operating from Pittsburgh headquarters for several years. In 1929 he was promoted to Pacific Coast Sales Manager with headquarters in California, and in 1931 was made Assistant Sales Manager for the entire materials handling division, with headquarters in Philadelphia. He is nationally recognized as an authority on the merchandising and distribution of materials handling equipment, and is accredited largely with the success now enjoyed by the Philadelphia Division of Yale and Towne. One of his prime responsibilities in his new position will be the maintenance and continued improvement of that organization.

Roots-Connersville Blower Appointments

J. B. Trotman, manager of the Turbine Pump Division of Roots-Connersville Blower Corporation, Connersville, Ind., announces, among others, the appointment of the following Southern territorial representatives: L. S. Pawkett & Co., Insurance Building, San Antonio, Tex., to promote sales throughout south central Texas; Power Machinery Co., 215 North Detroit Street, Tulsa, Okla., to promote sales of turbine pumps over the state of Oklahoma; H. K. Wilson, 2128 Fourteenth Street, South, St. Petersburg, Fla., to have charge of sales in the "peninsular state." In addition to its line of turbine pumps for industrial applications, boiler service units, and water systems, Roots-Connersville recently introduced the "R-C Auto-Jet" for deep-well service.

Chicago Bridge and Iron Personnel Changes

The Chicago Bridge and Iron Company, Chicago, Ill., announces the following changes in the personnel of its sales department: S. C. Hamilton, District Sales Manager at Birmingham, transferred to Houston, Tex.; R. A. Williams, who has been handling the sales of Morse filter plants, transferred to the office at Dallas, Tex.; H. F. Stearns, transferred from New York as District Sales Manager in charge of the Birmingham territory; A. H. Heineman, transferred from New York to the Birmingham Sales department; Herbert A. Guerin, transferred from the Cleveland office to the New York office; George Jewett, transferred from Chicago to New York, after spending several weeks at Birmingham studying special work the company does at the Birmingham plant; Ray Menefee, transferred from the Chicago Engineering department to the Cleveland office; William Fickett, transferred from the Chicago drafting room to the Chicago sales office, and Kenneth Sandbach, transferred from the Hillside erection office to the Philadelphia sales office. In addition to these changes in the Sales Department personnel, a new erection office has been opened in Houston, in charge of W. T. Hudson, formerly Assistant Manager of Operations in charge of erection at Chicago. Mr. Hudson will be assisted by Dan O'Laurie.

Chesapeake and Ohio Railway Report

According to the income statement, as embodied in the sixty-second annual report of the Chesapeake and Ohio Railway Company, there was a general increase in the business of the carrier for the year ended December 31, 1939. Operating revenues for the period amounted to \$18,722,054, an increase of \$12,345,571, or 11.61 per cent, as compared with 1938, while operating expenses amounted to \$8,859,621, an increase of \$4,413,601, or 6.85 per cent. Net operating revenue for 1939 amounted to \$9,862,432, an increase of \$7,331,970, or 18.92 per cent, while net income was \$27,342,711, an increase of \$6,659,878, or 32.20 per cent. Revenue coal and coke tonnage for 1939 was 53,028,340, an increase of 11.86 per cent, and other revenue freight tonnage was 12,544,360, an increase of 21.86 per cent. Total freight revenue amounted to \$111,270,263 for the year, an increase of 12.07 per cent, while passenger revenue was \$3,062,150, a decrease of 1.06 per cent. For the renewal of existing tracks, the company used 25,058 tons of new rail, largely 131- and 112-pound, and for maintaining existing tracks it used 420,287 cross ties.

Power and Mechanical Engineering Exposition

Scheduled for Grand Central Palace, New York City, from December 2 to 7, inclusive, the 14th National Exposition of Power and Mechanical Engineering is expected to attract an attendance of more than 40,000 visitors interested in equipment for the most economical generation, distribution and utilization of power. Already, more than 200 leading concerns have engaged exhibit space and choice locations are going rapidly, it is declared. The personnel of the advisory committee for the Show includes the following: L. E. Moulthrop, chairman; John H. Lawrence, vice chairman; Comfort A. Adams, E. G. Budd Manufacturing Company; Homer Adams, Past President, American Society of Heating and Ventilating Engineers; J. T. Barron, V. P., Electric Operation, Public Service Electric and Gas Company; R. E. Dillon, V. P., Production and Engineering, Boston Edison Company; Fred Felderman, Past-National President, National Association of Power Engineers; A. C. Fieldner, Chief, Technology Branch, U. S. Bureau of Mines; N. E. Funk, V. P., Engineering, Philadelphia Electric Company; F. E. Giesecke, President, American Society of Heating and Ventilating Engineers; G. E. Hulse, President, American Society of Refrigerating Engineers; George L. Knight, V. P., Brooklyn Edison Company, Inc.; David Moffatt Myers, Consulting Engineer; Joseph Pope, Stone and Webster Engineering Corporation; Arthur L. Rice, Editorial Director, "Power Plant Engineering"; Philip W. Swain, Editor, "Power"; Alfred Vaksdal, Plant Engineer, Corning Glass Works; Charles F. Roth, Manager, and E. K. Stevens, Associate Manager of the Exposition. The exposition, as in the past, will be managed by the International Exposition Company, Charles F. Roth, president.

MANUFACTURERS RECORD FOR



Structural Assembly Shop, Navy Yard, Philadelphia, Pa.
49,000 sq. ft. White and 19,000 sq. ft. Actinic, Corrugated
Wire Glass—side wall and monitor construction

SPECIFY ORIGINAL SOLID CORRUGATED WIRE GLASS

It *diffuses* light with a minimum of shadows. It is *practically* self-cleaning and can be used on a roof of any material and supply daylight in manufacturing and industrial plants—an important factor in all modern production.

Also used with excellent results on sidewalls, mar- quises, canopies and wherever daylight is needed.

Our Engineering Service Department can aid you on your skylighting problems. Write or wire.

PENNSYLVANIA WIRE GLASS CO.
1612 MARKET STREET
PHILADELPHIA, PENNSYLVANIA



LYONORE METAL will

STAND THE TEST



Proper use of the brake on galvanized Lyonore Metal allays the fear of flaking or peeling, because this famous Chromium, Nickel, Copper, Iron alloy sheet possesses a uniform close grain that grips the spelter coating firmly. Sharp corners and intricate shapes are easy . . . This alloy sheet provides remarkable corrosion-resistance and long life. Use genuine Lyonore Metal for all sheet metal requirements!

Lyon, Clark & Co. Inc.
WASHINGTON BALTIMORE

1860
Lyonore Metal

CHROMIUM — NICKEL — COPPER — IRON ALLOY

JUNE NINETEEN FORTY

8 TIMES THE TONNAGE PER MAN HOUR WITH TOWMOTOR



Conservative performance records, firmly established show that one man with a TOWMOTOR Lift Truck like the one shown above, can handle and stack 1092 cases per hour. Formerly, with hand trucks, a liberal estimate per man hour, was 134 cases.

Therefore, TOWMOTOR easily handles 8 TIMES the tonnage possible with hand labor, 4 to 5 times the tonnage possible with other types of mechanical equipment. Let us tell you what TOWMOTOR can do for you. Write today.

TOWMOTOR CO. 1237 E. 152nd St., Cleveland, Ohio

Southern Sales Offices

E. Deane Harrington,
17 Guilford Ave.,
Baltimore, Maryland,
Phone: Plaza 4262
Wharton L. Peters,
St. Louis Mart Bldg.,
St. Louis, Mo.
Phone: GA. 3050

W. C. Stich,
Phone 5-3812M
Jacksonville, Fla.
James J. Alvarez,
Merchants Nat. Bank
Bldg.,
Mobile, Alabama,
Phone: D Dexter 5882

C. G. Forshey,
909 M & M Building,
Houston, Texas,
Phone: Capital 5525
McVoy-Hausman Co.,
2019 Sixth Ave., North
Birmingham, Alabama,
Phone 7-5561



**"A FEW MORE MINUTES
AND OUR PROTECTION
WORRIES ARE OVER!"**



"WE were trusting to luck—and it wasn't comfortable. Our plant was exposed to thieves and marauders night and day. We had some losses from thievery—and what was worse, we were always worrying about what might happen.

"Fence looked like the best answer—so we called in Cyclone. Their recommendation fitted our needs exactly—and the price was right. Those fellows certainly put up a sturdy fence. The posts are set in concrete and the mesh is stretched tight. It's a good-looking fence that is sure to command respect.

"From now on hoodlums and thieves will have a tough time breaking in or making a quick get-away. It certainly takes a load off my mind to have this fence protection."

CYCLONE FENCE CO., DEPT. 860
Waukegan, Ill.

Please mail me, without obligation, copy of
"Your Fence—How to Choose It—How to Use
It." I am interested in fencing: ☐ Industrial;
☐ Playground; ☐ Residence; ☐ Estate;
☐ School. Approximately.....feet.

Name.....

Address.....

City.....

State.....

**Mail Coupon
for
FREE BOOK**



Send for our free 32-page book that tells all
about fence. Cramped full of illustrations.
Shows 14 types—for home, school, playground,
business. Whether you need a few feet of fence
or 10 miles of it, you need this valuable book.



CYCLONE FENCE

CYCLONE FENCE COMPANY, Waukegan, Ill.

Branches in Principal Cities

Standard Fence Company, Oakland, Calif., Pacific Coast Division

United States Steel Export Company, New York

UNITED STATES STEEL

INDUSTRIAL NEWS

Cooper-Bessemer Appointments

The Cooper-Bessemer Corporation, Mt. Vernon, Ohio, manufacturer of gas and Diesel engines and compressor units, announces that John Rogers has joined the company as a sales engineer and will soon assume his duties as Pacific Coast manager at the company's Los Angeles offices. J. W. Reed of the Los Angeles office has been transferred to the New York office, having been appointed Atlantic coast manager of the corporation's Gas Engine and Compressor Division. Mr. Reed joined The Cooper-Bessemer Corporation in 1924 and was made Pacific coast sales manager in 1929. Mr. Rogers graduated in 1911 from the School of Mechanical Engineering of the University of Southern California and has served with the Frank J. Kimball Company, oil-field and irrigation engineers, and with the Ingersoll-Rand Company. His territory with The Cooper-Bessemer Corporation will cover the entire west coast.

Pomona Pump Opens Eastern Office

With the establishment of an executive eastern office at 120 Broadway, New York City, the Pomona Pump Company, Pomona, Cal., and St. Louis, Mo., announces the election of C. L. Barrett, formerly General Sales Manager, to the office of Vice President in Charge of Sales, and the appointment of W. D. Turnbull as General Sales Manager in charge of the New York office. Associated with Mr. Turnbull will be Syed A. Camaris, well known waterworks engineer; G. H. Lambert, Eastern District Manager; Dan M. Wallace, National Accounts, and George H. Shetlin, Export Sales. Direct sales in the New York area are under the direction of Quimby-Ryan Engineering Sales Company, Inc., 1 East 42nd Street, as distributor. Prior to joining the Pomona organization, Mr. Turnbull was associated for seventeen years with the Westinghouse Electric and Manufacturing Company at Pittsburgh. For a number of years he was in charge of sales and engineering to the mining and petroleum industries and later as Manager of Machinery Electrification Sales.

All-Steel-Equip Company Expansion

Work has begun on a 40,000-square foot addition to main plant No. 1 of the All-Steel-Equip Company of Aurora, Ill., the enlargement to the plant and main offices being made necessary by a steady growth of the company during the past twenty-nine years. New offices, on the second floor, will be modern and practical in all details—windowless, air-conditioned, sound insulated, and illuminated by Fluorescent lighting. Larger shipping facilities will also be provided by the addition, which is under construction by Austin Company, Cleveland, Ohio. All-Steel-Equip Company manufactures the well known A-S-E Aurora Filing Equipment and Steel Desks.

TRADE LITERATURE

FLEXIBLE METAL HOSE—

Catalog G-21—"Rex-Weld and Rex-Tube Flexible Metal Hose," illustrated, devoting a section to interesting developments in flexible metal hose engineering—Rex-Bellows and C-M-H Stainless Steel Bellows with fittings attached by electric resistance circumference seam welding—Avioflex for fuel lines—RW-89 all-steel exhaust hose; presents technical data and illustrations covering the use of flexible metal hose for saturated steam and superheated steam, for conveying fluids and chemicals, and numerous special uses such as vibration absorbers for compressors, pumps and turbines, compensators for high temperature pipe lines, equalizer connections for gas burning furnaces, etc.; treats of two distinct types of tubing, annular corrugation (Rex-Weld) and spiral wound (Rex-Tube), providing a valuable reference guide to users of either or both.

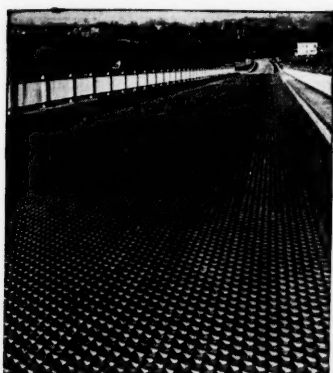
Chicago Metal Hose Corporation, Maywood, Ill.

REFRACTORY CONCRETE—

Booklet—24 pages, illustrated, dealing with Refractory Concrete made with LUMNITE, presenting methods of making refractory concrete for low, medium and high temperature furnaces, and showing annealing furnace and tunnel kiln car tops, door linings, precast roof arches, forge furnace front arches and other typical refractory concrete installations; also describes heat resistant concrete for construction of flues and ducts, as well as foundations and floors exposed to soaking heat; presents tables of mixes and other information.

The Atlas LUMNITE Cement Company, Chrysler Building, New York City.

NOT A PENNY for MAINTENANCE



Cairo Approach N. Y. State Hy. Dept.
Catskill, N. Y. Engineers

The above KERLOW BRIDGE FLOOR was installed in 1936. Engineers report Kerlow flooring has been free of all maintenance, even including snow removal. For your next Bridge Floor (old or new) specify KERLOW proven floors.

All types of Industrial Floors and Safety Steps.

Agents in all principal cities.

Write for special technical data

KERLOW STEEL FLOORING CO.

218-C Culver Ave., Jersey City, N. J.
Telephone BErgen 3-8932

A New Sales-Building "Tool"

POOR'S

1940

**Register of Directors
of the U. S. and Canada**

Lists more than 90,000 of the nation's business leaders, both alphabetically and geographically . . . helps you contact the key men in every industry, in every community . . . gives addresses, business affiliations, date and year of birth. It lists, too, over 13,000 corporations, shows the officers and directors of each.

Send for sample pages

POOR'S PUBLISHING CO.
90 Broad Street, New York

Doing Business In 35 Languages

by Westinghouse



They have learned to make change in lira, pesos and shillings as simply as you and I count our change from a dollar bill.

- *During* the past two years we have run an advertising campaign in 95 newspapers in 41 countries. Each advertisement is translated into 7 different languages. 25 entirely different currencies are used to pay for the newspaper space.

- *Climate also plays* an important part in the distribution of our products throughout the world. For instance, a radio set which is perfectly suitable for sale in the United States must be specially designed and treated to stand up under tropical humidities before it is acceptable to countries near the equator.

- *Another product problem* is that of electric voltage and frequency. Here in the United States 110 volt 60 cycle current is standard almost everywhere, but in export territories these voltages range anywhere from 90 to 380 volts, and from 16% to 133 cycles.

- *Add to these problems* the complications of the present world strife. But business goes on as ever, and our export people insist that theirs is the most interesting business in the world.

- *All of the products* that we make, from the grain of wheat lamp for doctors to immense turbines for power companies, find their way to the farthest reaches of the globe. American products find a ready market abroad. And the fact that these products sell at higher prices in competition with those locally manufactured is a tribute to American craftsmanship and salesmanship.

- *To youngsters or oldsters* whose hobby is collecting stamps, the incoming mail department of our export company would very likely prove a paradise.

- *A single day's mail* will bring letters from as many as twenty-five countries. In the course of a year, correspondence is received from practically every country in the world, and it has traveled to us by every conceivable mode of transportation from Tibetan runner to air express. It may be penned in anything from a Chinese ideographic script to just plain American English. More than thirty-five different languages will find their way in and out of the mail basket.

- *No doubt* you have heard many men say that their business "is different." But rarely will you find a business right here in our own country that is as really different as that of our people whose responsibility lies in the shipment and sale of our products abroad.

- *Most of these men* have spent years in the field, in Buenos Aires, Singapore, London, Cape Town. They have sold our products in Spanish, French, Portuguese, Swedish and even more remote tongues.

TEXAS

(Continued from page 35)

dova cream" is an oolitic stone of excellent quality.

In addition to the use in building, much stone is available for crushed stone, fluxing stone, magnesia production, mineral food, poultry grit, terrazo granules, and a number of other uses. Recent commercializations consist of a plant for manufacture of poultry grit from gray granite and the production of fine pulverent limestone for use in cattle feed and other uses where a pure calcium carbonate is needed.

Sulphur—Texas and Louisiana hold a virtual sulphur monopoly of the world. Texas produced 86 per cent of the sulphur produced in 1938. In addition to the large salt dome sulphur deposits of the Gulf Coast, Texas has lower grade deposits in Culberson, Reeves, and Pecos counties. Considerable interest has been shown in these deposits recently.

Talc (soapstone)—Large deposits of soapstone are present in Gillespie, Blanco, and Llano counties. The pure mineral talc is present only in limited quantity but it is believed that the soapstone is of a degree of purity that will produce a highly satisfactory ground product.

Vermiculite—This mineral is present in Llano and Mason counties both as small flaked material in schist and as larger flaked material associated with a serpentine mass.

Metals

Bismuth — Native bismuth and bismuthite are present in a pegmatite in Llano County. These minerals are associated with molybdenite and a small amount of gold. Prospecting has not yet revealed a commercial grade of ore.

Chromite—In the serpentine mass of Blanco and Gillespie counties nodules and masses of chromite are present. The concentration of chromite appears unlikely to be sufficient to allow commercial development.

Copper, gold, and lead—Deposits primarily of copper are scarce in Texas. Most of the copper is obtained as a by-product of silver mining. All of the gold and lead obtained is a by-product of silver mining. These metals are produced in Trans-Pecos Texas chiefly from Presidio and Hudspeth counties. Some gold is found in the Llano region. Lead is present in the Cap Mountain formation of Cambrian age in the Central Mineral region of Texas but as yet the possibility of commercial production has not been proven.

Iron—Magnetite is present in Llano, Mason, and Gillespie counties. No large bodies of magnetite are known but as yet little attempt has been made to determine the amount of ore present. The brown iron ores of east Texas have caused the greatest amount of discussion. An estimate of the ore present by Eckel, U. S. Geological Survey Bulletin 902, page 67, is as follows:

Probably available	
now or in near	
future	139,119,000 long tons
Possibly available	
but too thin or	
low grade for large-	
scale operations ..	37,489,000 long tons

Total 176,608,000 long tons

This ore is present in Cass, Morris, Marion, Upshur, Cherokee, Henderson, and Anderson counties.

Manganese—Small and mostly low grade deposits of manganese ore are known in Texas. In Val Verde County low grade manganese ore fills fissures and cavities in a limestone. Some ore has been shipped from Jeff Davis and Mason counties.

Mercury—The Terlingua district of Brewster County is the mercury producing area of the State. Production figures are not available for distribution.

Molybdenum — The mineral molybdenite is occasionally encountered in the Central Mineral region. The largest amount yet found is on Honey Creek in Llano County. However, insufficient has been found to be commercial.

Rare-earth minerals—During the era of gas lighting, these minerals were produced from Barringer Hill, Llano County. As electricity increased in its use the amount of rare-earths used for gas mantels decreased and mining operations were terminated. Barringer Hill is now flooded by Lake Buchanan, but other localities above water have been reported.

Silver—The silver production of Texas is chiefly from Presidio and Brewster counties. Silver accounted for more than half of all the metals produced in Texas during 1938.

Tin — About \$5,000 worth of tin has been produced from the east flank of the Franklin Mountains in El Paso County. The tin mineral cassiterite is present near Streeter, Mason County, but the possibility of its presence in commercial quantities has not been tested.

Zinc—The amount of zinc produced in Texas has been small and has been a by-product of silver mining.

VIRGINIA

BY

Dr. Arthur Bevan, State Geologist

VIRGINIA contains deposits of four of the "strategic," two of the "critical," and seven of the "essential" mineral resources. Some of these raw materials exist in such quantity or in such concentration that they have long been important in American industry. Others have been mined more or less sporadically as market conditions stimulated their production. Mining of a few has been attempted without continued success. Deposits of still others have been prospected or mined in an exploratory manner.

The strategic materials, manganese, mica, nickel, and tin occur in Virginia. Manganese ores are widely distributed in the western Piedmont, along the lower west flank of the Blue Ridge, and throughout the Valley and Ridge province to the west. They have from time to time been extensively mined. Much manganese remains in the ground, but the ex-

tent of the mineable reserves is unknown. Mica occurs in the pegmatites in Piedmont Virginia. The deposits are local. Considerable mining has been done.

Nickeliferous deposits have long been known in the Blue Ridge Plateau southwest of Roanoke. The tenor and quantity available have not encouraged market development. Considerable prospecting has been done in recent years.

Tin also has long been known in the Irish Creek district in the Blue Ridge northeast of Lexington, where cassiterite-bearing veins occur. Mining was attempted in the period 1884-1893, when title litigation caused work to be stopped. Specimens of high-grade ore were found. The old tunnel has recently been cleaned out

and further study of the deposits is in progress.

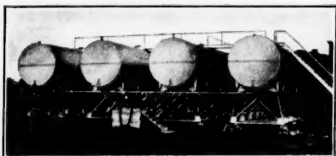
The most important "critical" raw material mined in Virginia is titanium. Large deposits of rutile and ilmenite are found in Nelson County, and rutile has been reported from several other places. The American Rutile Co., at Roseland, has long been supplying the market with rutile. Roseland is considered the world's chief source of rutile. During recent years, the Southern Mineral Products Corp., at Piney River, has been mining ilmenite from an apatite-ilmenite rock (nelsonite).

Another critical mineral, graphite, occurs in Virginia, chiefly as low-grade material in schist in the middle Piedmont, but higher grade deposits in Albemarle County were mined for a short time. The outlook is not promising.

(Continued on page 54)

SOUTHLAND PRODUCTS

—WELDED OR RIVETED—



We now manufacture and offer to the trade tanks in all sizes for pressure or gravity work. Also other steel equipment of either

WELDED
OR RIVETED
CONSTRUCTION

This applies to field as well as shop built equipment.

Write us for information and quotations.

CHATTANOOGA BOILER & TANK CO.
CHATTANOOGA, TENN.

"COMMERCIAL" TUNNEL LINERS

Most efficient method of roof support. Can be adapted to any size or shape of tunnel. Provides maximum safety.

WRITE FOR OUR BOOKLET

THE COMMERCIAL SHEARING AND
STAMPING CO.
YOUNGSTOWN, OHIO

CREOSOTED TIES, PILING, POLES, POSTS, CROSS ARMS, and LUMBER

WOLMANIZED LUMBER—

Decay and Termite Proof—Can Be Painted

Docks for Ocean Vessels

American Creosote Works, Inc.
New Orleans, La.

Atlantic Creosoting Co., Inc.
Norfolk, Virginia

Plants at: New Orleans; Winnfield, La.; Louisville, Miss.
Savannah, Ga.; Jackson, Tenn., and Norfolk, Va.



Nickel-clad or Stainless Vessels

Starch kettles, digestors, vats, and other vessels of this durable metal. Your designs or ours—"custom made" to order.

TANKS, TOWERS, BOILERS, KIERS, KETTLES
STANDPIPES, SMOKESTACKS, AIR RECEIVERS, Etc.

Write for "Tank Talk" No. 1-D

R. D. COLE MANUFACTURING CO.
ESTABLISHED 1854
NEWNA GEORGIA

DAVIS CYPRESS WATER TANKS

LIVE UP TO EVERY CLAIM

New plants coming South naturally install our cypress tanks, once for all for cypress lasts indefinitely. We can submit plenty of evidence from paper, pulp, dye, and knitting mills, etc. Send us your inquiries for wood pipe. Let us hear from you.

G. M. DAVIS & SON
P. O. Box 5,
Palatka, Fla.

VIRGINIA

(Continued from page 52)

The essential raw materials in Virginia include arsenic, abrasives, lead, magnesium (in dolomite), phosphate, pyrites, zinc, and zirconium. Arsenopyrite in Floyd County was mined at times between 1903 and 1919, and supplied arsenic during the World War. Emery in Pittsylvania County was mined for abrasives.

Zinc, with some lead, is mined at Austinville, in Wythe County. Both have been prospected at other places in the Valley province and some mining was done in early years. Both occur also in the Piedmont counties of Albemarle, Louisa, and Spotsylvania, where they were once mined, with production as re-

cently as 1916.

Deposits of pyrite, reported to be large, in Louisa, Prince William, Stafford, and Spotsylvania counties were mined about 20 to 50 years ago. Pyrrhotite in the Great Gossan Lead in Carroll and Grayson counties is now being mined.

Apatite derived from the nelsonite at Piney River, in Nelson County, has for several years been used in the production of calcium monophosphate. Zircon-bearing sandstone has been reported from the vicinity of Ashland, Hanover County.

Virginia west of the Blue Ridge contains enormous deposits of limestone,

ranging in grade from almost pure limestone through magnesian limestone to dolomite. Much of this rock is readily available for quarrying and accessible to railroads. Numerous large quarries are in operation along the length of the Valley from Winchester to Cumberland Gap.

Coal in abundance and other materials of importance in domestic economy during normal times, but especially during a world war, occur in Virginia. The recoverable coal in Virginia was estimated in 1929 to be about 22 billion tons, of which 900 million tons is semianthracite, 400 million tons is semibituminous, and the other is bituminous.

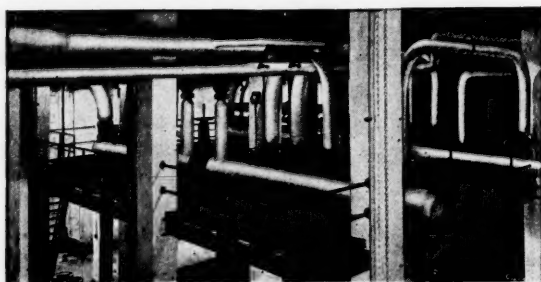
WEST VIRGINIA

WHILE only one of the minerals—manganese, listed as *strategic* is now being produced in West Virginia, other important or *essential* materials, especially fuels and their many chemical derivatives, are available in large quantities.

Coal, which is the state's principal mineral, consists of several seams, one of them alone constituting the most valuable single mineral deposit known anywhere in the world. Every kind of bituminous

coal is found in West Virginia and its production exceeds that of any other state. Yet coal reserves of a commercial character have been conservatively estimated at more than one hundred billion tons and while production already is large, it is reliably stated that the coal operators could double their production with little additional change in plants. Similarly, each of the other raw materials could be greatly increased.

At the present time, West Virginia is the largest producer of chemicals among the southern states and one of the largest in the country. With enormous supplies of coal, gas, natural gasoline, oil and brine coupled with its strategic geographic location, West Virginia occupies an increasingly important position as the source of manufacture of these items and their by-products into chemicals and other vital commodities.



Carey
INSULATION

CONTRIBUTES TO COMFORT AND ECONOMY in New U. S. Department of Justice Building

ONE of the largest and most beautiful of the new government buildings is that housing the Department of Justice. A 7-story structure costing more than \$11,000,000, it has 1,237,000 sq. ft. of floor space. The extensive steam system, and the air-conditioning system of 1800-ton capacity, are insulated with CAREY Heat Insulation. This is but one of the notable insulation jobs completed in recent years on government buildings in the National Capital.

CAREY Insulations save fuel, conserve heat. Whatever the insulation requirements of your heating and air-conditioning jobs, CAREY Products can satisfy them. Write for CAREY Insulation Catalog—Address Dept. 61.

THE PHILIP CAREY COMPANY • Lockland, Cincinnati, Ohio
Dependable Products Since 1873
BRANCHES IN PRINCIPAL CITIES

The Chain-link Fence Corp.



Heavily galvanized after weaving, resists corrosion. Hercules H-1 posts, strongest, heaviest, unbreakable arms, form backbone of good fence. Gates, with fool-proof latch bars, ball and socket hinges, built to withstand severe use and abuse. MFRS. and ERECTORS. Agents everywhere. Catalogue, 1620-40 West 31st Street, Chicago, U. S. A.

ROYAL'S NEW NO. 1

YEARS AHEAD! With Features of the Future!



Give it
THE DESK TEST
... in your own office!

ROYAL TYPEWRITER CO.
Baltimore, Md. Plaza 7033

ROYAL more than ever WORLD'S NO. 1 TYPEWRITER

STOP THE RAVAGES OF DRY ROT AND TERMITES

by pressure-treating your lumber and timber with ZMA or Creosote. Eppinger and Russell Co.'s preserving process increases the life of woods from 8 to 20 times. For more than half a century, the outstanding utilities and industrial plants have depended upon Eppinger and Russell Co. for long-life, low-maintenance lumber that is immune to decay, dry rot and termite attack.

PRESSURE-TREATING PLANTS AT:
Jacksonville, Fla.,
and
Long Island City, N. Y.

WOOD PRESERVERS SINCE 1878
EPPINGER AND RUSSELL CO.
84 Eighth Ave., New York City

NEW Sewer and Culvert Construction

By making concrete pipe on the job with Quinn Forms you give more men more work, can use less experienced labor and produce uniform concrete pipe of highest quality. Recognized standard of all concrete pipe.



**QUINN
PIPE FORMS**

Quinn Heavy Duty and Medium Duty Pipe Forms best for hand or wet process pipe. Give more years of service. All diameters—12 to 84 inches. Tongue and groove or bell end pipe, any length.

WRITE for New Book on Concrete Pipe giving information and prices, valuable tables on production costs, strength tests, Pipe Forms, Pipe Machines, etc. Book sent free.

QUINN WIRE & IRON WORKS 1605 12 St. Boone, Iowa

STRUCTURAL STEEL for BUILDINGS and BRIDGES

Capacity 1000 Tons per Month. 3000 Tons in Stock

Carolina Steel and Iron Company

The Largest Steel Fabricators in the Carolinas
Greensboro North Carolina
S. C. Rep., Edward McCrady, 307 Allen Bldg., Greenville, S. C.

Bristol Steel & Iron Works, Inc. STRUCTURAL STEEL

For Buildings, Bridges and All Industrial Purposes
BRISTOL, VIRGINIA-TENNESSEE

District Sales Offices:

431 Third Nat'l Bank Bldg., 501 Public Service Bldg.,
NASHVILLE, TENN. ASHEVILLE, N. C.

CONVERSE BRIDGE & STEEL CO.

Chattanooga, Tennessee

Structural Steel for all Industrial Structures,
Buildings and Bridges.

LARGE STOCK FOR IMMEDIATE SHIPMENT

BELMONT IRON WORKS

PHILADELPHIA

NEW YORK

EDDYSTONE

Southern Sales Offices, Charlotte, N. C.

Engineers . Contractors . Exporters

STRUCTURAL STEEL
BUILDINGS AND BRIDGES
RIVETED-ARC WELDED
BELMONT INTERLOCKING
CHANNEL FLOOR

Write for Catalogue

Main Office—Philadelphia, Pa.
New York Office—44 Whitehall St.

DESIGNERS AND ENGINEERS

Fabricators of:

Structural steel bridges, buildings, tanks,
general plate work, barges, towboats, large
cargo vessels, passenger vessels, tankers
and refinery equipment.

THE INGALLS IRON WORKS COMPANY

Birmingham, New York (1 E 42nd St.), Atlanta, Pittsburgh and
New Orleans

Address: Birmingham, Alabama

CRUSHED STONE

Only highest grades of crushed

LIMESTONE AND GRANITE

Meeting all specifications

CAPACITY—8000 tons daily

Blue Ridge, Va. Pembroke, Va. Pounding Mill, Va.
Boxley, Greenville County, Va.

W. W. BOXLEY & COMPANY

Boxley Building, ROANOKE, VA.

SAND—GRAVEL—BRICK FILTER GRAVEL

Washed Sand and Gravel for Concrete
Roads and Buildings

Filter Gravel, all sizes—Building Bricks

FRIEND & CO., INC. River St., Petersburg, Va.

SAMPLES
ON
REQUEST

B. Mifflin Hood Company

WRITE
FOR
LITERATURE

Chemical Stoneware:

ALL TYPES CHEMICAL BRICK AND SHAPES.
SPIRAL, DIAPHRAGM, & RASCHIG RINGS.

Quarry Tile:

ALL TYPES QUARRY FLOOR AND WALL TILE.
ROOF TILE AND FACE BRICK.

PLANTS: DAISY, TENN.; ADAIRSVILLE, GA.;
NORWOOD & GULF, N. C.

OFFICES: ATLANTA, GA.; DAISY, TENN.;
CHARLOTTE, N. C.

Steel Company to Modernize West Virginia Plant

Follansbee Steel Corporation announces that equipment has been ordered and construction work started on the \$1,270,000 modernization program at the company's Follansbee, W. Va. plant. New cold reducing mills and auxiliary equipment will be ready for operation by early Fall.

New equipment to be installed includes two 34-inch wide, single stand, four-high reversing cold reducing mills and one 43-inch, single stand, four-high temper mill, along with auxiliary shearing, cleaning, pickling and annealing equipment. These mills, together with the present 38-inch wide cold reduction mill installed at the Follansbee plant in 1933, and such other of the company's present rolling equipment as will be continued in use, will give a total capacity of 145,200 tons per year of flat rolled products. These include sheets, tin plate,terne plate, roofing terne, black plate and electrical sheets.

Cyclone Fence Co. Acquires Savannah Plant

Purchase of the Savannah Wire Cloth Mills by the Cyclone Fence Co., subsidiary of U. S. Steel Corp., from the Port Wentworth Corp. was announced recently by C. F. Hood, President of Cyclone, and Robert M. Nelson, President of Port Wentworth.

The Savannah Wire Cloth Mills consist of a modern screen cloth manufacturing plant located just outside of Savannah, Ga., in Port Wentworth. The plant is devoted to production of electro-galvanized steel screen wire and bright bronze

screen wire, both of which are woven in 16 and 18 mesh. The plant was erected in 1935 and enlarged in 1938 and is situated on approximately 28½ acres of land on the Coastal Highway and is served by the Savannah & Atlanta Rwy. Co.

R. E. Pinniger, Vice-President and General Manager of the Cyclone Fence Co., stated that it is intended to continue the operations of the Savannah plant in order to serve satisfactorily the screen cloth demands of a progressing South.

The Cyclone Fence Co. was incorporated in 1906, although predecessor companies dated back to 1887. It became a part of the U. S. Steel Corp. in 1924.

The company is one of the leading fly screen manufacturers, as well as the recognized leader in the chain link fence industry of the country.

Port Wentworth Corp., a successor to companies founded in 1916, was incorporated in 1934 in Georgia. Besides the Savannah Wire Cloth Mills and the town of Port Wentworth, the Corporation owns a substantial acreage for industrial sites on the Savannah River a few miles above the city of Savannah.

This entire area is served by the Savannah & Atlanta Rwy. Co. which is controlled by the Port Wentworth Corp. and these two interests have over a period of years been developing this section with industrial plants.

26th Fuel Engineering Conference

The twenty-sixth fuel engineering conference to be held in Washington, D. C., June 21, at the Shoreham Hotel, will be the first time the Appalachian Coals, Inc., engineers have scheduled a meeting in the

east. Since 1934, twenty-five conferences have been held in the middle west and South, the last having been held at Ann Arbor, Mich., April 22, upon invitation of the University of Michigan.

Industrial executives, fuel engineers, power engineers and others interested in fuel technology from the Carolinas to Maine, J. E. Tobey, vice president in charge of engineering for A. P. I., stated, are being invited to attend this conference. It will be a one-day session, largely educational in nature.

Well-known speakers, who will be recognized because of their broad experience with bituminous coal and coal-burning problems, have been obtained to participate in this symposium, which will begin at 9:00 a. m. A dinner at 6:30 p. m., will be attended by Assistant Secretary of War Louis Johnson, who will speak on "National Defense and Industry" and Dr. H. E. Howe, editor of Industrial and Engineering Chemistry, whose topic will be "Science in the New Competition."

Hanes Knitting Mill Nears Completion

P. H. Hanes Knitting Company's new seven-story building in Winston-Salem, N. C., is approximately 95% complete, J. E. Sirmine & Company, consulting and designing engineers of Greenville, S. C., state. They awarded the contract for the power and lighting wiring to the All State Electric Company of Winston-Salem, the sprinkler system to Grinnell Co., Charlotte, N. C., and the contract for the high-speed, self-levelling freight elevator to Otis Elevator Co. also of Charlotte. The building for which C. M. Guest & Sons, Anderson, S. C., were awarded the con-

(Continued on page 61)

ESTABLISHED
1905

THIRTY-
FIFTH
YEAR

REGISTERED TRADEMARK

FLEXIBLE SHAFTS AND MACHINES

— EXCLUSIVE MANUFACTURERS —
IN ALL PARTS OF UNITED STATES
SOUTH—EAST—NORTH—WEST
— STRAND —
HIGH QUALITY MACHINES
ARE SERVING INDUSTRY



Type MY 4

SIXTY TYPES AND SIZES
1/8 to 3 H.P.

Confer With Your Dealer
or
Write Us Direct for Catalog

GROUND ROTARY CUTTERS



N. A. STRAND & COMPANY
MAIN OFFICE AND FACTORY
5001 - 5009 No. WOLCOTT AVE., CHICAGO

Ornamental and Industrial PERFORATED METALS




We carry a large stock for
immediate shipment.
Send for Our Catalogue.

Manhattan Perforated Metal Co., Inc., 43-17 37th St., L. I. City, N. Y.

Filtration and Pumping Equipment

For Water Works and Swimming Pools
Sales and Installation

BURFORD, HALL AND SMITH
140 Edgewood Avenue, N. E.,
Atlanta, Georgia

FINE GEARS

of all Materials—All
Types and Sizes


Spur Gears—1/8 in. to 30 ft. in diameter
Bevel Gears—1/8 in. to 13 ft. in diameter
Spiral Gears—1/8 in. to 10 ft. in diameter
Worm gears any practical size. Racks curved
or straight. Fast Delivery—Fair Prices.

THE EARLE GEAR & MACHINE CO.
4719 Stenton Ave., Philadelphia, Pa.
140 Broadway, New York City



GLAMORGAN

PIPE & FOUNDRY CO.



LYNCHBURG, VA.



Two Fine New Buildings Equipped with



Refrigeration

Which provides cold drinking water and "cold" for restaurant service at the Federal Reserve Board Building, in Washington (shown at top), and complete air conditioning for the Federal Land Bank Building, in Baltimore (at left). Both installations are credited to the Paul J. Vincent Co., Engineers and Contractors, who are Frick Distributors.



Baltimore's Federal Land Bank Building is Air Conditioned by these No. 3 Frick machines.



You'll find Frick Refrigerating, Ice-making and Air Conditioning Equipment in thousands of important buildings, from Shanghai to Boston.

Let us quote on the cooling equipment you need: the public appreciates the benefits of modern refrigeration service. Write, wire or 'phone

WAYNESBORO, PENNA. U.S.A.
FRICK CO.
DEPENDABLE REFRIGERATION SINCE 1882

JUNE NINETEEN FORTY



Figure the Cost OVER MANY LONG YEARS

First, a Layne Well Water System will greatly increase your water supply. Second, the low operation will usually drastically reduce your water service expense. And, third, the annual saving in operation cost will retire the entire installation cost within a few years.

The use of finest quality materials, rugged construction throughout, and advanced engineering features mean many long years of service. Many Layne Wells and Pumps are still in regular use after a quarter century of service. No other well water developing organization can point to such records of efficiency.

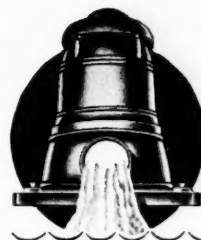
Any City, Factory, Paper Mill, Oil Industry, Railroad, Irrigation, or business official may secure a complete file of bulletins, catalogs and folders on Layne Well Water Systems without obligation. Address

LAYNE & BOWLER, INC.
Dept. X-1, Memphis, Tenn.

LAYNE

PUMPS & WELL WATER SYSTEMS

For Municipalities, Industries,
Railroads, Mines and Irrigation



AFFILIATED COMPANIES

LAYNE-ARKANSAS CO. STUTTGART, ARK.
LAYNE-ATLANTIC CO. NORFOLK, VA.
LAYNE-CENTRAL CO. MEMPHIS, TENN.
LAYNE-NORTHERN CO. MISHAWAKA, IND.
LAYNE-LOUISIANA CO. LAKE CHARLES, LA.
LAYNE-NEW YORK CO. NEW YORK CITY,
AND PITTSBURGH, PA.
LAYNE-NORTHWEST CO. MILWAUKEE, WIS.
LAYNE-OHIO CO. COLUMBUS, OHIO
LAYNE-TEXAS CO. HOUSTON AND
DALLAS, TEXAS
LAYNE-WESTERN CO. KANSAS CITY, MO.
CHICAGO, ILL. OMAHA, NEBRASKA
LAYNE-WESTERN CO. OF MINNESOTA
MINNEAPOLIS, MINN.
LAYNE-BOWLER NEW ENGLAND COMPANY,
BOSTON, MASSACHUSETTS
INTERNATIONAL WATER SUPPLY, LTD.
LONDON, ONTARIO, CANADA

New Frontiers For American Youth

(Continued from page 43)

is a reflection of his own ideals, of his dreams." He added a bit of tangible advice by counselling youth that "the motion picture is the weapon by which youth increasingly will bludgeon its elders into thinking its way."

Other speakers who offered "inside information" on industrial opportunities included Hortense M. Odum, president of Bonwit Teller, New York; Mary Van Kleeck, director of the Department of Industrial Studies, Russell Sage Foundation; R. I. Zimmerman, vice-president of United States Steel, and Major Albert Sobey, director of General Motors Institute.

That the clinic achieved something that might be termed as a new formula for relationship between industry and education, is indicated by the enthusiastic comments of various members of the university faculty.

For example, Edwin Van de Walle, dean of the college for men, said: "There are a lot more new frontiers than I thought . . . I was surprised at the unanimity of the opinions expressed. These men were all looking for the individual who senses opportunity and they need and want men of that sort even in the most highly specialized field."

Richard L. Green, assistant professor of English, said: "The clinic removed the erroneous belief in a gulf between men in business and men in academic work. The same kind of brains and the same kind of application are necessary in both fields."

Putting his finger upon the "humanizing" effect of the get-together, Dr. Lee A. DuBridge, dean of the Faculty of the College of Arts and Sciences, said: "This clinic has given students a chance to see that the much maligned captains of industry really aren't such bad fellows. Their honesty and sincerity, as well as their faith in American youth, seems to have impressed students here."

Dr. Robert Metzendorf of the University library said "These have been a fruitful three days for the students, not only in learning new job possibilities but also new techniques of applying for the job which they find themselves suited for. From the social angle, actual meeting of business leaders was invaluable."

South Bid For Share In Defense Program

(Continued from page 25)

to expand plants or equipment, acquire and store raw materials; and it is indicated, to aid in the proposed program of Government-financed storage of vital raw materials needed by industry.

This suggests a further possibility that

such storage facilities might well be located in Southern areas which might otherwise not be deemed adaptable to war industry. The stable nature of the populace in these sections makes selection of storage sites in them a sound procedure, in the opinion of some observers concerned with possibilities of sabotage under certain conditions.

Plans along these lines have not had time to crystalize, and it is recognized in Washington that they are necessarily formative at this time. However the pace of events indicates that they may have to be accelerated. In the case of sites of Government built and Government operated facilities, the sum of factors enumerated here, it has been indicated, will weigh heavily, the decision in each instance probably going to the locality that can make the best case.

Correction

In featuring the City of Norfolk, Virginia, on the front cover of the May issue of the MANUFACTURERS RECORD, credit for the photograph was inadvertently given the Norfolk Chamber of Commerce. The correct source was the Norfolk Advertising Board.

BATTERY CHARGERS—

Folder—devoted to the use of Hobart Quick Battery Chargers for charging airplane batteries and for keeping auxiliary starting units charged at all times; publication illustrates special Hobart charging equipment for charging 24-volt batteries used in modern aircraft.

Hobart Brothers Company, DM-575, Troy, Ohio.

Blaw-Knox GRATING

**5 STRIKES
IN A ROW!**

Non-slip
because of
the twisted
bar

Electroforged
one-piece
construction

Maximum
open area
for light and
air

Easily
maintained
paint reaches
entire surface

Self cleaning—
no sharp corners
to clog

FREE

Paper weight size sample. Just fill in and mail the coupon.

BLAW-KNOX DIVISION of Blaw-Knox Co.
Farmers Bank Bldg., Pittsburgh, Pa.

SEND GRATING SAMPLE TO

Name _____

Street _____

City _____ State _____

LINK-BELT POWER

TRANSMISSION EQUIPMENT



• Your power transmission services can be improved—costs reduced and uninterrupted operation assured with this modern line of power transmission units. The line includes anti-friction and babitted bearings, take-ups, clutches, couplings, collars, pulleys, gears, hangers, etc.

LINK-BELT COMPANY—Philadelphia, Chicago, Indianapolis, Atlanta, Baltimore, Dallas, Houston, New Orleans, Los Angeles. Distributors throughout the South. 7386-B

McLANAHAN

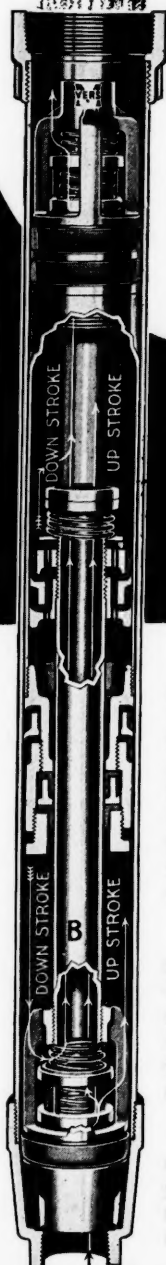
EQUIPMENT

ROCK—SAND—GRAVEL



Single and double roll and jaw crushers, hammer mills, super dry pans, steel log washers and scrubbers, sand drags, revolving and vibrating screens, elevators, conveyors, dryers, jigs, hoists. Complete portable, semi-portable and stationary crushing, screening and washing plants for different capacities of any materials.

McLanahan & Stone Corporation
Established 1835
Hollidaysburg, Pennsylvania



A GUSHER of SALES and Satisfaction with MYERS DOUBLE ACTING CYLINDERS

Today Myers brings you the most modern, the most dependable double acting cylinders on the market. There is nothing experimental about them. Designed by experts, built to precision standards, their reputation for dependable and economical service is firmly established in pump circles the country over.

Whether conditions are regular or otherwise, Myers Double Acting Cylinders satisfactorily solve most deep well pumping problems. They furnish the plus volume of water that lowers pumping costs and satisfies the most critical of users.

If you require more water from any source at lower cost than is possible to secure by ordinary methods write us for circular and complete information.

THE F.E. MYERS & BRO. CO.
ASHLAND, OHIO

PUMPS-WATER SYSTEMS-HAY TOOLS-DOOR HANGERS



PERFORATED METAL

of every sort

for Screening, Grading, Ventilating or any industrial purpose. Also Grilles of many beautiful designs.

5631 Fillmore St., Chicago, Ill.

New York Office: 114 Liberty St.

The
Harrington & King
PERFORATING CO.

ERDLE

PERFORATED SHEET METALS

SIXTY YEARS' experience in Metal Perforating is your assurance of a satisfactory job.

Made to your specifications and shipped promptly.

Metal Sample Plate on Request.

ERDLE PERFORATING COMPANY,
171 York Street, Rochester, N. Y.

PERFORATED METALS

For every purpose, Industrial and Ornamental

Steel, Stainless Steel, Monel Metal, Brass, Copper, Bronze, Aluminum, Zinc, Lead, Tin Plate and all other metals or materials perforated as required, and for all kinds of screens. Send for new Catalog.

CHARLES MUNDT & SONS
400 Johnston Ave., JERSEY CITY, N. J.

HENDRICK PERFORATED METALS

Screens and grilles in all commercially rolled metals, all standard and special designs.

Write for literature

HENDRICK MANUFACTURING CO.
44 Dundaff Street, Carbondale, Pa.
Manufacturers of Mitco Open Steel Flooring, Mitco Shur-Site Treads and Mitco Armorgrids.

Old Bay Line Celebrates Hundredth Anniversary

Marking 100 years of continued operation and service, the Baltimore Steam Packet Company, popularly known as The Old Bay Line, celebrated on May 23rd the 100th anniversary of its founding. Bearing the distinction of being the oldest steamboat line in the United States, The Old Bay Line has progressed with the growth and development of the country. In 1840 the Line began its service in a territory sparsely settled, opening it up to commercial and travel possibilities not then dreamed of and playing a significant part in the building of Virginia, Maryland, Delaware and contiguous regions, fostering the growth of business in the states it linked.

Since the original steamer of the Line,

the Georgia, left the port of Baltimore to make its first sail on the Chesapeake Bay, the United States has passed through several wars and economic depressions and has experienced marked changes in its social set-up. The Line, however, continued to fulfill its purpose to offer an economical and comfortable means of transportation between Baltimore and Norfolk. It still offers the same service, improved with the passing of the years.

Features of the anniversary celebration, which began in Baltimore, included a meeting at the Lord Baltimore Hotel where Governor Herbert R. O'Connor, Mayor Howard W. Jackson of Baltimore, and City Managers Charles B. Borland of Norfolk, Charles F. Harker of Portsmouth, and Joseph C. Biggins of Newport News, were greeted by officials of the company, the latter including L. R. Powell, Jr., president; R. E. Dunn, Vice Presi-

dent; General Henry M. Warfield, member of the board, and others. From the Lord Baltimore Hotel the party, in horse-drawn vehicles, rode to Pier 19 where the Old Bay Line steamer, General Warfield, was docked preparatory to a dinner on board before sailing for Norfolk. Miss Louise Lazenby, social directress of the Warfield, served as hostess at the dinner and on the trip to Norfolk. Guests and officials of the company making the Norfolk trip were entertained on the boat and at Norfolk, as well as at the Hotel Cavalier at Virginia Beach.

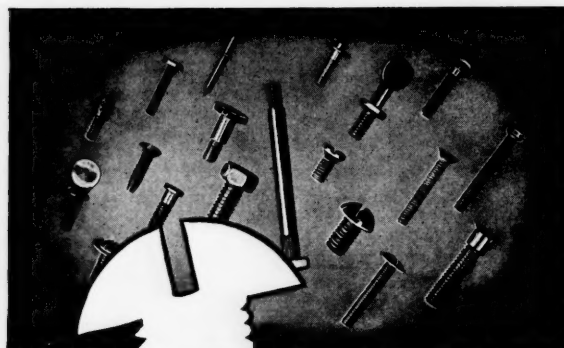
VIBRATING SCREWS—
Catalog No. 1762—20 pages, illustrating and describing Link-Belt Vibrating screens for effective screening of a great variety of materials such as sand, gravel, cinders, grain, clay, crushed stone, coke, fertilizer, feldspar, coal, ore, etc.
Link-Belt Company, Philadelphia, Pa.; Chicago, Ill., and San Francisco, Cal.



While cosmopolitan in its general appeal, and modern up to this moment in its equipment, there is a peculiar flavor of The Old South here which Southerners are quick to note and appreciate. They feel at home and come back to us again and again.

Rates \$3.00 per day and up. Every room with bath or shower. Centrally located.

The Southern Hotel
BALTIMORE

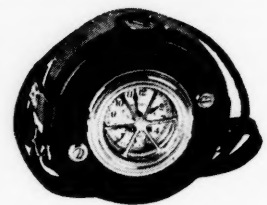


PROTECT your product — and reduce costs — at every point where fastening devices are required by using screws and headed parts by PROGRESSIVE. Let PROGRESSIVE items, produced efficiently and accurately by the cold upset process, show you the way to substantial savings both in original costs and in assembly operations. In addition to standard machine screws and nuts, PROGRESSIVE is equipped to meet demands for made-to-order parts in any metal. We invite you to submit your problems to PROGRESSIVE specialists for intelligent, prompt solution.



The PROGRESSIVE MFG CO
TORRINGTON...CONNECTICUT

DETEX
WATCHMEN'S
CLOCKS



DETEX WATCHCLOCK CORPORATION

404 Glenn Building, Atlanta, Ga.

1207 Liberty Life Building • Charlotte, N. C.

NEW YORK • CHICAGO • BOSTON • ATLANTA

CANNING MACHINERY
FOR

FRUITS • VEGETABLES • FISH • CITRUS FRUITS • ETC.

A. K. ROBINS & CO. INC. BALTIMORE, MD.
WRITE FOR CATALOGUE

**CLAY WORKING
MACHINERY**

FOR BRICK, TILE AND BLOCK,
FROM SMALLEST TO LARGEST CAPACITY.

Write for information

J. C. STEELE & SONS, STATESVILLE, N. C.

SCREWS for every need

You can depend on us for
QUALITY • EFFICIENCY • SERVICE

SAMUEL J. SHIMER & SONS
MILTON, PENNSYLVANIA

Resale Machinery Department

Continued from page 63

SUB STATIONS

600 KW G.E. 250 v. 2300/3/60 M.G. Syn.
300 KW G.E. 250 v. 2300/3/60 M.G. Syn.
300 KW West. 250 v. 2300/440/3/60 M.G. Syn.
200 KW West. 250 v. 2300/4000/3/60 Rotary.
200 KW West. 250 v. 2300/3/60 M.G. Syn.
150 KW West. 250 v. 2300/4000/3/60 M.G. Syn.
100 KW Ridge 250 v. 2300/3/60 M.G. Syn.
75 KW West. 250 v. 2300/3/60 M.G.
200 KW West. 550 v. 2200/3/60 M.G. syn.

ENGINE GENERATOR SETS

300 KW. G.E. 3/60 Skinner Unitflow.
125 KVA Allis Chalm. 220/440 Turbo.

TRANSFORMERS

3-333 KVA Pgh. 2300-115/230 1/60.
1-100 KVA West. 6000-220/110 1/60.
3-37½ KVA West. 22000-2200 1/60.
5-50 Kva. Pgh. 2300/220-440/1/60.

SLIPRING MOTORS

4-700 HP. G.E. 2300/3/60 303 rpm.
4-500 HP. G.E. 2300/3/60 450 rpm.
1-400 HP. West. 440/220/3/60 1170 rpm.
2-300 HP. W. 2200/3/60 580 rpm.
1-250 HP. West. 440/220/3/60 690 rpm

Duquesne Electric & Mfg. Co., Pittsburgh, Pa.

FARRELL JIB CRANE FOR SALE

All steel Jib Crane—14 foot mast—20 foot boom.
Will lift fifteen ton by hand.

Also has Chicago Pneumatic Giant Air Hoist attached. Will hoist or move three ton load. **NOW IN OPERATION.** Cost \$2000.00, sell for \$500.00.
Also have Chicago Air Hoist lift 1000 lbs. load.

M. E. Reinhart, 281 Chapel Ave.,
Jersey City, N. J.

Hanes Knitting Mill

(Continued from page 56)

tract, rests on Raymond's concrete piles, has steel frame, brick walls, steel sash, 20-year tar and gravel roofing, wooden floors, and covered platform along the railroad side, as well as the usual elevator, stair towers, etc. Manufacturers of underwear, athletic shirts and shorts, P. H. Hanes Knitting Company employs about 2900 persons. P. H. Hanes is president and general manager.

"Wrought Iron for Radiant Heating Installations."—Recently observing an undercurrent of interest in what is "variously referred to as radiant heating, panel heating, floor heating or slab heating," A. M. Byers Company of Pittsburgh, Pa., manufacturers of genuine wrought iron, tubular and flat rolled products, and steel tubular products, while recognizing that the principle involved in such heating was not altogether new, pondered the idea that the adaptation of radiant heating to the better class of small homes, particularly those without basements, would be feasible. Along this line, the company has prepared a bulletin, under the above title which presents a non-technical discussion of the principles of radiant heating and reports modern practice in installing such systems. It is explained that the company's direct interest in the subject extends only so far as is necessary to determine the corrosive conditions encountered in this type installation, but following an established policy of keeping abreast of significant trends which may lead to the use of corrosion resistant materials, it has accumulated data of immediate interest to architects, designing engineers and construction engineers responsible for the development of the new idea, but which do not pertain directly to problems involving corrosion.

Read **THE WALL STREET JOURNAL**
for Complete Markets and all
BUSINESS FINANCIAL-INDUSTRIAL NEWS
The Newspaper of Successful
Business Men and Investors
44 BROAD ST. NEW YORK, N. Y.

CLASSIFIED . . . OPPORTUNITIES

Clocks

KLOCKS FOR ALL PURPOSES
Watchman's Clocks, Time Recorders and

Supplies
L. E. Kaiser Clock Co.
321 N. Charles St., Baltimore, Md.
24 HOUR SERVICE ON ALL REPAIRS

Machinery and Supplies

MOTOR BARGAINS

220-440 Volt, 60 Cycle, 3 Phase, 3450 Speed
Each \$60.00
2- 20 H.P. Continental Motors
1- 30 H.P. Fairbanks Morse Motor .. 72.00
1- 75 H.P. General Electric Motor .. 100.00
1-100 H.P. Northwestern Motor .. 112.50
220-440 Volt, 60 Cycle, 3 Phase, 1750 Speed
1- 25 H.P. Fairbanks Morse Motor .. \$72.50
1- 50 H.P. Allis Chalmers Motor 95.00
1-100 H.P. Robbins & Myers Motor .. 148.50
1-200 H.P. General Electric Motor .. 200.00
PRICES COVER MOTORS ONLY AND
ARE CASH F.O.B. CHICAGO. SUBJECT
TO PRIOR SALE. MANY OTHER SIZES
IN STOCK.

BUTLER ELECTRIC COMPANY
1855 Milwaukee Ave., CHICAGO

Business Opportunities

For Sale—Townsite on prettiest lake in South Florida. Excellent rail and highway facilities, lights, soft water, hotel, stores, \$50,000 worth of streets, good school, congenial people and no bonded debt. Unusual opportunity for developer of means. For details write "Florida", c/o Mfrs. Record, Balto., Md.

ATHENS ROLLER MILL: 3 story brick building, six acres, water power dam, flour mill, corn mill, feed mill and all accessories doing good business—priced to sell winding up settlement—good terms. ATHENS REALTY COMPANY, First National Bank Bldg., Athens, Tennessee.

Any part of 80 acres of land, 100,000 ft. of shed space; 450 h.p. boilers plant; 350 h.p. Nordberg engine. Ready for your business. Located on rail and water transportation, and speedway to new 20 million dollar Navy Air Base will go through the center of this property, which is for sale or lease.

Also warehouse and display stores in center of town.

GRESS MFG. CO. OWNERS,
JACKSONVILLE, FLA.

Factory Sites

WANTED: A FACTORY
Will give free use of buildings to factory employing 100 to 500 workers.
Rowland Lunn Lewisburg, Tenn.

Ten acres level cleared land adjacent to Republic Steel plant, Gadsden, Ala. Suitable for industrial uses.
Inquire R. B. Maguire, 5405 S. 6th Court, Birmingham, Ala.

FACTORY SITE: and large building can be purchased in center of TENNESSEE VALLEY DEVELOPMENT. ATHENS REALTY COMPANY, First National Bank Bldg., Athens, Tennessee.

Patent Attorneys

PAUL B. EATON, Patent Attorney,
1408-R Johnston Bldg., Charlotte, N. C.,
514 Munsey Building, Washington, D. C.,
417 Wachovia Bldg., Winston-Salem, N. C.

PATENTS SECURED. Low cost. Reasonable terms. 72-pg. book & advice free. Confidential, personal service. Reg. Pat. Atty. L. F. Randolph, Dept. 749, Washington, D. C.

For Sale or Lease

SOUTHERN MANUFACTURING EXCEEDS ELEVEN BILLIONS ANNUALLY
Brand new manufacturing plant located in progressive industrial and agricultural section of northern Mississippi. Reinforced steel and brick construction building 80 x 150 feet—two stories with twenty thousand square feet of floor space. Wired for light and power. Equipped with sprinkler system, steam heat and freight elevator. Located on main line of Mobile & Ohio Railroad and paved highway extending from Gulf to Great Lakes. Ample supply of white and colored labor. Reasonable concessions and fullest cooperation offered to interested parties.

For further particulars address,
CHAMBER OF COMMERCE,
OKOLONA, MISS.

Inventions for Sale

MANUFACTURERS—Write for our FREE Classification Sheet of Inventions for Sale, covering 135 main subjects, and in one or more of which you will doubtless be interested. ADAM FISHER CO., 578 Enright, St. Louis, Mo.

Position Wanted

By a man with 25 years executive and selling experience in Steel Industry. 17 years with one corporation 5 years with another. Positions held range from Cost Clerk to President, including 5 years as Manager of Sales. Age 51 years—health excellent. Too young to retire. Desire new start in South having faith in its industrial potentialities. Willing to submit complete information regarding experience and qualifications together with references from all previous employers.

Address No. 9460, Care Mfrs. Record

PROPOSALS

WAR DEPARTMENT. Office of the Constructing Quartermaster, Fort Bragg, N. C. Sealed proposals in triplicate will be received until 11:00 A. M., EST, June 11, 1940, and then publicly opened for the construction and completion of Booster Pumping Station, Steel Stand Pipe, and appurtenances at Fort Bragg, N. C. Plans and specifications are on hand in the Office of the Constructing Quartermaster, Fort Bragg, N. C., and will be furnished upon written request and deposit at that office of certified check in amount of \$10.00, payable to Treasurer of the U. S.

Bids June 25

Proposal for Arkabutla Dam—U. S. Engineer Office, Vicksburg, Miss.—Sealed bids will be received here until 10 a.m., C.S.T., June 25, 1940, and then opened, for furnishing all plant, labor, and materials, and performing all work for constructing Arkabutla Dam on Coldwater River, approximately seven miles northeast of Pritchard, Mississippi, and approximately nine miles southwest of Hernando, Mississippi. Further information on application.

For Sale: Building and Site

One story building about 40,000 square feet and over four and a half acres in city limits; sprinkler system; cheap insurance; private track and located between two railroads.

Address P. O. Box 563, Savannah, Ga.

WAREHOUSE SITE

FOR SALE

Adjacent main line two railroads. Suitable distributing plant. Address

P. O. Box 951, Raleigh, N. C.

RESALE MACHINERY DEPARTMENT

"WE BUY, REBUILD, SELL OR RENT"

BINS
9-1-118 ton Blaw Knox; 2-85 ton Heltzel; 1-60 yd. Butler V-80; 1-72 ton Blaw Knox; 1-60 ton V-40; 2-35 ton Blaw Knox; 1-26 ton Heltzel with Kron dial scale. All above with or without volume weigh batcher.
1-300 bbl. Johnson portable Cement Plant with elev.
CRUSHERS
5-1-12"x26" Champion; 1-12"x20" Acme; 1-10"x20" Climax No. 25; 1-9"x16" Teismith No. 9A; 1-9"x15" Champion.
3-Gyratory: 1 No. 5 Gates; 1 No. 3 McCully; 1 No. 0 McCully.

Also: Air Compressors, Blowers, Boilers, Buckets, Conveyors, Cranes, Derricks, Hammers, Hoists, Locomotives, Mixers, Pavers, Pneumatic Tools, Pumps, Rollers and Shovels.

Send for Complete Stock List.

EQUIPMENT CORPORATION AMERICA

CHICAGO-1166 S. Wash-
naw Ave. Phone Nevada 2400

PHILADELPHIA-1505 Race Street
Phone Rittenhouse 4664

PITTSBURGH-P.O. Box
933. Phone Federal 2000

AIR COMPRESSORS:

Elec.: 676, 1300, 1578, 2200 & 2850 Ft.
Bltd.: 368, 540, 676, 870 & 1300 Ft.
Diesel: 105, 368, 425, 603, 900 & 1300 Ft.
Gasoline: 110, 220, 315, 415 & 500 Ft.
Steam: 150, 308, 540, 1500 & 1958 Ft.
CRUSHERS: Jaw 48x42, 16x9, 18x10, 24x13, 36x15, 30x10, 30x15, 36x24, 36x48
STEEL TANKS: 10,000, 15,000 & 20,000 Gal.
BOILERS: Economic-60, 100 & 125 H.P.
BUCKETS: Clamshell-4, 1 Yd. & 2 Yd. Cap.
LOCOMOTIVES: Gas and Diesel-4, 6, 8, & 14 ton, 20 ton, 30 ton & 55 ton.
CRANES: Caterpillar-6 ton, 12 ton, 15 ton
CRANES: Locomotive: 15, 20, 25 & 35 ton
HOISTS: Steam-6x8, 7x10, 8x10 & 9x12
Electric: 35, 60, 100, 125, & 400 H.P.
Gasoline: 15, 35, 60, 80 & 110 H.P.
MIXERS: Concrete: 10S, 14S, 21S & 28S
DERRICKS: GUY: 5 ton, 7 1/2 ton, 15 ton
Stiff Leg: 8, 10, 15, 25 and 75 ton Cap.
BELT: Conveyor: 14 in., 16 in., 18 in., 24 in., 30 in., 36 in., 40 in., 60 in.
IDLERS: 36 in., 30 in., 24 in., 18 in., 16 in. and 14 in.
DRYERS: 42"x24", 5"x35", 60"x30", 68"x60"
HAMMERMILLS: 36x24, 24x18, No. 3, 4 & 6
SCREENS: Vibrating: Hummer 4x5 & 3x5
CARS: Dump: 1 Yd., 1 1/2 Yd., 3 Yd., 12 Yd.
ENGINE: Diesel: 60 H.P. & 100 H.P. F.M.
170 KVA 3 P., 60 C., 2300 V. WORTH-
ING DIESEL UNIT.

R. C. STANHOPE, INC.

875A Sixth Ave. New York, N. Y.

SHOVEL ATTACHMENT

For Sale

One complete shovel attachment for Lorain 77. First class condition. Price: \$1250.00 f.o.b. Raleigh.

North Carolina Equipment Co., Raleigh, N.C.

ALBERT & DAVIDSON PIPE CORP.

PIPE
NEW-USED-UNTESTED
2nd Ave. 50th-51st St. EST. 1904 Brooklyn, N.Y.

PIPE

Reconditioned pipe, new threads and couplings, all sizes, 1/2 in. to 36 in., guaranteed suitable for all practical purposes.

MARINE METAL & SUPPLY CO.
167 South Street, New York City

NEW-USED RECLAIMED FROM 1917
ALBERT PIPE SUPPLY CO. Inc.
Berry and North 13th St. Brooklyn, N.Y.

NEW PIPE USED

For Every Purpose

Large stocks carried everywhere for spot shipment

JOS. GREENSPON'S SON PIPE CORP
National Stock Yds., (St. Clair Co.) Ill

PIPE
VALVES and FITTINGS
All Sizes in Stock
NEW-USED
GREENPOINT IRON & PIPE CO. INC.
Boquet and Meadow Sts. Brooklyn, N.Y.

TRANSFORMERS

WE SELL--PURCHASE--RENT
Power & Dist. Transf. from one to 5000 KVA. Any Volt. or Frequency.

Catalogue & Prices On Request
PHILADELPHIA TRANSFORMER CO.
2829 Cedar St. Phila., Pa.



SALES AND REPAIR SERVICE

3-400 KVA Gen. Electric Transformers, \$900.00
60 cycle, 22000-2300/4000Y volts. EACH

We carry a complete stock. Write for Catalog No. 135-E

All transformers guaranteed for one year.

WANTED: Transformers, burned-out or in operating condition.

THE ELECTRIC SERVICE COMPANY, Inc.

"America's Used Transformer Clearing House" "Since 1912"

Station M. Cincinnati. Ohio

TRENCHERS

1-Cleveland "Baby Digger" 18 1/2" buckets.
2-Parsons Model 21, 18" buckets, 5 ft. depth.
2-Parsons Model 21S, 18" buckets, 7 ft. depth.
1-Parsons Model 25, 24" buckets, 10 ft. depth.
1-Parsons Model 25, 18" buckets, 10 ft. depth.
1-Austin Model 100.

BACKFILLERS

6-Buckeye Model F, caterpillar mounted.
10-Cleveland combination backfillers and tampers.

AIR COMPRESSORS

PORTABLE AND TRUCK-MOUNTED, GAS

3-110 cu. ft. Sullivan type WK 312.
1-220 cu. ft. Sullivan type WK 314.
1-320 cu. ft. Sullivan type WK 314.
4-330 cu. ft. Metalweld Worthington Model K.
2-110 cu. ft. Sullivan type WK 312; mounted on G.M.C. 1 1/2 ton pneumatic tired auto truck.
2-110 cu. ft. Metalweld Worthington; mounted on Model A 1 1/2 ton Ford trucks with pneu. tires.
1-90 cu. ft. Ingersoll Rand; mounted on Model A 1 1/2 ton Ford truck, with pneumatic tires.

Richard P. Walsh Co., 30 Church St., N.Y. City

RECONDITIONED EQUIPMENT

One Thomas three drum hoist with 80 H.P. electric motor, \$975.00
One Thomas 40 H.P. gasoline two drum hoist with attached swinger, \$650.00
One Clyde 25 H.P. two speed two drum scraper hoist, \$500.00
One Lambert 80 H.P. electric twin drum mast and gas hoist, \$1000.00
Two United 8 H.P. gasoline driven single drum hoists, \$150.00 each
Two Thomas 35 H.P. electric two drum hoists with attached swingers, \$600.00 each
Two United 15 H.P. gasoline single drum hoists, \$250.00 each
Two Thomas 100 H.P. gasoline double drum hoists, \$1650.00 each
Two Sullivan 310' portable air compressors, \$650.00 each
One Thomas 90 H.P. gasoline double drum hoist, \$1400.00
One 10 H.P. electric capstan winch, \$250.00

Crane Type Motors

3 and 2 phase, 60 cycle, 220 or 440 volts

125 H.P. G.E. 720 R.P.M. \$750.00
100 H.P. G.E. 900 R.P.M. \$600.00
80 H.P. G.E. 720 R.P.M. \$450.00
60 H.P. G.E. 900 R.P.M. \$325.00
50 H.P. G.E. 900 R.P.M. \$275.00
40 H.P. G.E. 900 R.P.M. \$225.00

UNITED HOISTING CO., INC.

Serving the Construction Industry for 47 years
167 Locust Avenue New York, N. Y.

REBUILT

MOTORS and GENERATORS

MOTOR REWINDING

V-C ENGINEERING CO., INC.

1004 MAIN ST., NORFOLK, VA.

Write for Catalogue No. 17

WE BUY AND SELL

Power Plants, D.C. and A.C. Motors, Generators, Transformers, Pumps and Elec. Instruments. Give us the opportunity of bidding. NOTE: We carry a diversified stock, and your inquiries will receive immediate attention. Satisfaction guaranteed.

Superior Electric Machinery Co.
2829 Cedar St. Phila., Pa.

778 HP B & W ASME Watertube Boiler. 200#
200 & 300 KW Skinner Uniforms. 220-440-2300 volts.
240 HP Fairbanks Morse 200 KVA Diesel Generator.
180 HP Fairbanks Heavy Duty Dredge type Diesel.
120 HP Atlas Imperial 6 cyl. Diesel Power Unit
25 & 30 ton Plymouth std. ga. Gas Locomotives.
25 ton Ind. Brownhoist Gaso. Locomotive Crane.
Steel Sheet Piling-Rail-Tanks-Pipe-boilers
Mississippi Valley Equipment Co.
505 Locust St. St. Louis, Mo.

DIESEL ENGINE GENERATOR PLANT

3-Duplicate 219 KVA G.E. Alternators 2400/480/240 V. 3 ph. 60 cy. 200 RPM each direct connected to 300 HP Buckeye Diesel Oil Engines complete.

10 years old. Perfect condition.

MOORHEAD-REITMEYER CO. INC.

30th & Brereton Sts., Pittsburgh, Pa.
May, 1900